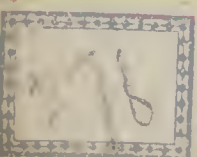


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Gr 19

Gr 19, 100 ft. in length

PP 29-76 in the Dugout

" 17" Dugout has underlying sand for
about 1/2 mile. Dugout is much
more than 1/2 mile.

Gr 19, 100 ft. in length, 100 ft. in width
The sand is 1/2 mile, only

No. 1000 - 2000 ft.

W. L.?

APPROXIMATIONS

TO

TRUTH,

NATURÆ NOVUM ORGANON.

ARISTOTLE WROTE THE ORGANON OF SCIENCE: BACON WROTE THE
NOVUM ORGANON OF POSITIVE PHILOSOPHY: THE "ORGANON
NATURÆ" IS NOW GIVEN TO THE WORLD.

"Per HUMUM evolvuntur; EòQUE omnis superstitio
respicit, tanquam INDE initia gentis, IBI regnator
omnium Deus, cætera subjecta atque parentia."

TACITUS.

"Now, Truth, perform thine office,—waft aside
The curtain drawn by Prejudice and Pride."

COWPER.

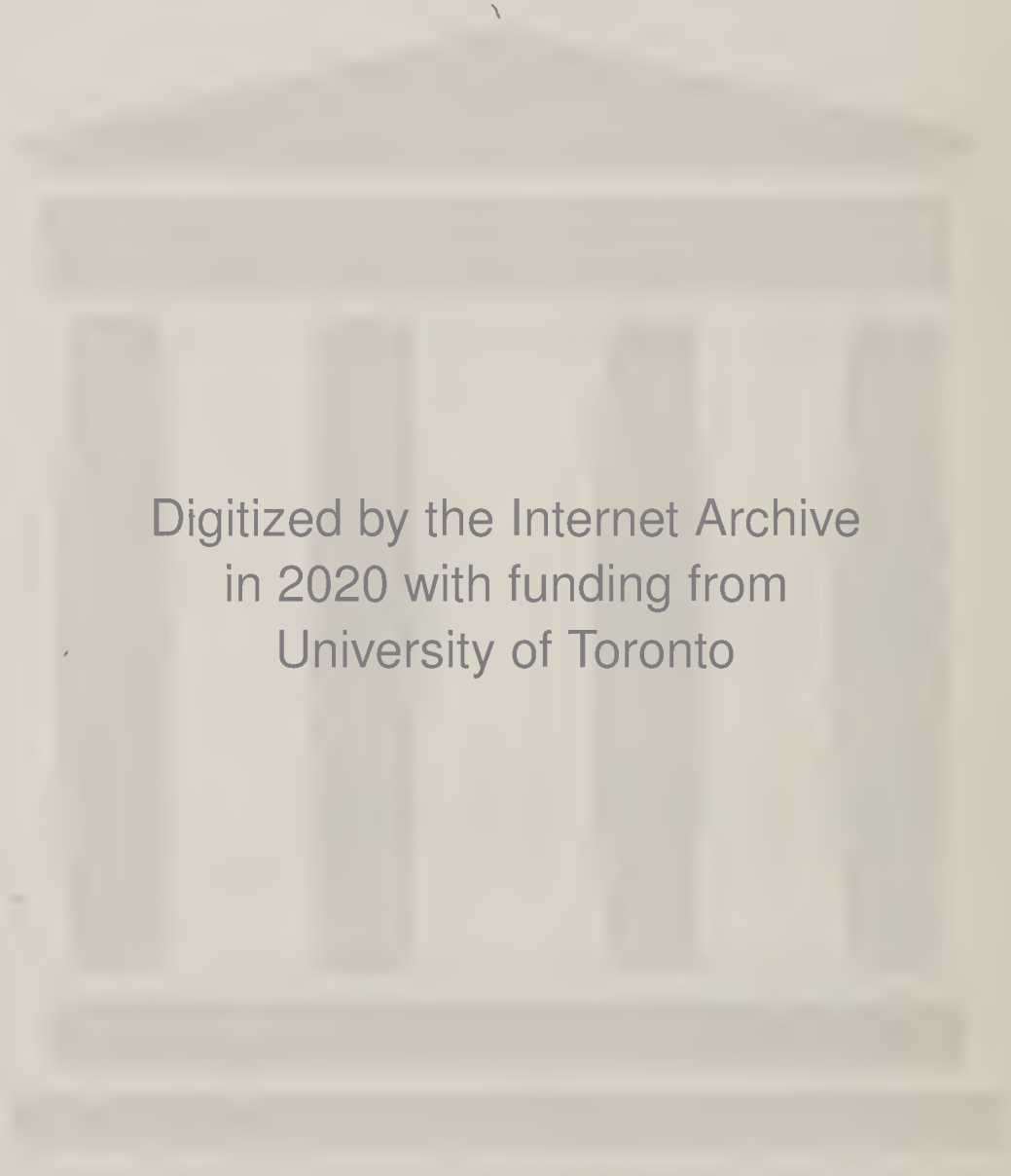
"See through this air, this ocean, and this earth,
All matter quick and bursting into birth!"

POPE.

London :

MANN, 39, CORNHILL.

1861.



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P R E F A C E.

WE venture to commit to the Press these preliminary Chapters of a New Organon of Nature.

Fragments of our grand whole are being published from year to year by highly-gifted and laborious gentlemen, whose kindred toil, unconscious co-operation though it be, immensely lightens the weight of our own labour. Some of these gentlemen prove, in detail, the particular facts from which we generalize. Others almost anticipate some of our conclusions. And all these true-hearted endeavours we thankfully avail ourselves of, and gratefully acknowledge as so much testimony the more in favour of the one great scheme of Nature's work, which it has been the delight and the dream of our life to expound and simplify.

Whether we have succeeded or not we humbly leave to the decision of both the present and the future. We are sure we have laboured earnestly, and, as far as in us lay, truthfully and honestly, to grasp the grand general laws which lie hid in the facts of Nature. If we have failed to make the conclusions we have arrived at as clear to others as to ourselves, we may at least claim this merit—that we have intensely amplified the proof of an eternal Law-giver existing in ages, to us unimagined, and by us incomputable, but even then having gloriously given forth His stupendous Fiat, which resolved itself into all those endless sequences of cause and effect, we are only just beginning to adequately comprehend, and the intelligent contemplation of which can have but one operation on all reasonable creatures—the elevation of their souls, in wondering and purifying adoration, from Nature up to God.

ERRATA.

—o—

On page	11, line 10, for	prove	read	proves
	31, 28,	varioussimiads		various simiads
	36, 20,	material		maternal
	46, last line,	lion		lions
	54, line 3,	these		them
	57, 8,	Tom's		Toms
	59, 14,	temperature		temperateness
	65, 11,	northernly		northerly
	68, 6,	it		at
	73, 16,	race-		race,
	76, 1,	purely		surely
	88, 1,	canditions		conditions
	94, 10,	slow		sloe
	124, 18,	disintegrated		disintegrated

ANNOUNCEMENT.

A LARGER Work on the same subject being now in progress, the Author would gratefully receive any contradiction or information with which it might please any scientific or critical reader of this Treatise to honour him. The communication might be addressed to the Author, N. N. O., care of Messrs. MANN, 39, Cornhill.

APPROXIMATIONS TO TRUTH.

CHAPTER I.

“WHAT IS TRUTH?”

“*Infinita ut est Natura, ita est Progressio.*”

It is easy to ridicule truth, just because it is difficult to hit off the exact degree at which the apparently ridiculous slides into the sublimely true. Truth is so simple in its sublimity, that vulgar or prejudiced minds are dissatisfied with its mere simplicity, and would fain have to believe “some great thing,” some wonderful, unnatural, and improbable statement. In short, there are many like the respectable old lady, who was scandalized at hearing her nautical young kinsman tell of “flying fish,” but devoutly believed him when he said the anchor of his ship had, on a certain occasion, brought up one of Pharoah’s chariots from the depths of the Red Sea.

We expect, then, that the following "Approximations" will meet with undisguised ridicule in exact proportion as they approximate to, not deviate from, Truth.

Our "Approximations" concern the development theory of Animal Progress, and we think we can adduce a vast amount of inductive evidence in favour of that theory.

We would first familiarise the mind with certain leading ideas concerning such facts as we contend for in these approximations. For the sake of example, there is a strange animal, well known in that country of strange animals, Australia, as the *Ornithoryncus Paradoxus*; or, as some people call it, the duck-billed Platypus. It has the body of a rat, and the bill and feet of a duck; and it has four short legs. A few years ago one was killed in Norfolk, according to *The Times* newspaper, in a duck-pond, in presence of many villagers. In Australia they are tolerably plentiful. Now, the very existence of this creature proves the existence of a link between birds and quadrupeds. It is, undoubtedly, partly duck, and partly rat. It is no hybrid or mule; it is a distinct, though middle species;—it is just such an animal as might be expected to develope, in some future descendant of its race, into a true rodent, such as the rat or beaver, which, like its progenitor, is also amphibious. This, my old-fashioned readers will say, is very ridiculous! Besides, the proof is wholly wanting—whoever saw the duck's offspring become a

Paradoxical Platypus? And who can believe such a change unless he has witnessed it? Far be it from us to check any healthy scepticism: by all means suspend your judgment, and weigh the evidence before you decide. But you do not seriously mean that you will believe in nothing as a fact, unless your own eyes have seen it? You never saw the origin of many wonderful things, but they had an origin beyond the power of disbelief; and so of the Platypus—he must have had a progenitor; and we believe, were his pedigree traced back far enough, a duck-progenitor. And we think the mere deficiency of personal attendance at the development of the animal is no proof against his duck origin. Is he more unlike his duck-legged relation, than a frog to a tadpole? Nay, is he not in much the same stage as a changing but legless frog, but only more permanently delayed in that middle stage, just as the flitter-mouse is more permanently delayed in its middle passage from bird to mouse? The fact is, very few of us ever try to observe the commonest operations of nature. In our childhood we walk of mornings in a garden—we see the ground strewn with fallen fruit, but how few of us ever see an apple fall! How few ever see a globule of frog-spawn burst into a tadpole, and grow on till arms spring out, tail drops off, legs appear, and the creature ceases to be a fish, and crawls to land!

Men are only just beginning to try to see these things; and we contend that they may see development going on if they will. But to return to our old friend

the duck-bill : we ridiculously said he might be progenitor to a water rat. Well, as the increasing or retiring waters of the period allow, fresh species are formed of the original genus ; that is, as conditions of residence, food, and climate vary, so will the animal naturally accommodate itself to them. Thus, if the water gradually dries up, the water rat becomes a land rat, and, ceasing to live on aquatic food, gnaws land roots and plants. According to circumstances, some rats become rabbits, others squirrels, or advance to hares, others to guinea pigs, or other true rodents. As we have mentioned guinea pigs, we may at once say that the large or true pig is descended from a tapir, from a kind of sea-horse, in its turn descended from a fish, probably without having ever passed through the bird-stage. It must be evident that development, if it exist at all, must be as infinite as the conditions of nature itself ; and thus we may truly say, that granting one fact of development, allowing that development exists at all, development must and does exist in as infinite a degree as the constituents of that mundane conglomeration of solids, fluids, and gases we commonly style "Nature."

Is there one fact—one instance of development ? Let the vegetable world first shew you its nauseous sea-weed developed into delicate sea-kale ; its hedge geranium developed into the stately pelargonium ; its sloes, crabs, and wild berries into plums, pippins, and British Queen strawberries. Let the animal world shew you its improved and developed breeds of horses, sheep, cattle, poultry, pigs ;—

ask any intelligent breeder of stock what he can do, what he has done, to develop any change in any animal he desires. He will tell you he can, at pleasure, develop fat, bone, length of limb, shortness of limb, strength, speed, hardness, delicacy; and he can, in fact, in a few years, effect a great and evident development in a flock of any animals. And are deviations from parental similitude a strange thing? It is our general effort, from a sort of shame at having a prodigy, to keep things as they are, and to conceal monstrosities; but we cannot help all kinds of odd deviations. We may separate them from our flocks, or kill them off, and, in a small way, over races, which we seem to command absolutely, we may check any manifest change of which we disapprove, during the few years each man's experience lasts; but what is this in the duration of "Nature?" If we mark one little change in fifty years, and we may mark a change in ten, five, two years, even a few months, in some cases, what development may not be expected in the countless centuries of the earth?

The savans of England in a recent assembly of the British Association did not deny that a certain process only of mother earth's cooling required 350 millions of years—some pot-work 13,000 years old was fished up in the Nile Valley the other day—some trees dug up in America, near New Orleans, are concentrically reckoned as at least 57,000 years old—everything we see may only be in its tad-pole or duck-bill stage, a period of

transition, but that transition extending over more than mortal cognisance, and therefore *seeming* to be perpetual. The light of a certain fixed star, comparatively near to us, takes two million years to strike our earth with its feeble ray. Even in this time, 2,000,000 years, what changes must have occurred, what developments taken place! There has elapsed, then, plenty of time for any amount of development to take place in. We have pointed to various facts in the natural world within our own experience, proving some development does take place, and we have said that as the constituent particles, the conditions generally of nature are, to us, infinite, so must we regard the development, the changes, the progress, of the different forms composed of these infinite atoms, to be infinite also. And thus we may at once understand that some races may be traced up through almost every known kind of animal, others through comparatively few. As the conditions of nature have varied, so have the developments of the creatures of her substance.

We will, by way of concluding these introductory remarks, give a few instances illustrating the infinite variability of natural development. That singular specimen of lazy, yet swift humanity, the Australian Black, points, as he himself personally declares, to the Kangaroo as his "old man" (Query, being unlike Papuans, Maori, or other men, whence else can he be?) Some of the North American Indians indicate, by their unchangeable ferocity, and unimproveable habits of living from

hand to mouth, a directly bestial origin. We regard the bears and panthers as the true ancestors of those savage warriors, who will build no house, till no field, and learn no humanizing art; but who delight in blood, howl with joy at a fight, plunder, steal, destroy, and value only the scalps and teeth of their fellow-creatures; and therefore like the wolves in England they will *die out* as civilization demands their departure. It is a sad necessity; but man, even partly-civilized, cannot expose his wife, children, and herds, to semi-wild beasts, and therefore cannot afford to wait until they approach his own moral and intellectual condition.

On the contrary, the polite and friendly Mandans, mentioned by Catlin, as beginning to be civilized, but too few to cope with their numerous wild environners, were either a far older stock or, as we believe, descended from deer; and, therefore, eventually, when once hemmed in, the natural prey of the fiercer tribes.

The Mexicans, again, had a bird origin. The adjutant birds of Asia, the ostrich and the condor, are sufficient to shew us that birds are quite big enough even now to furnish the substratum of a tolerably sized man; and the classic fable of Leda and the swan, with her human offspring issuing from eggs, may serve to shew that the idea of bird-origin was not foreign to the men of old. But as we shall have to make copious reference to classic times we now revert to the bird-sprung Mexicans. Like their feathered progenitors, the Mexicans excelled in *building*; they flocked together in settled abodes like

rooks in a rookery, instead of wandering about in search of fresh hunting grounds as the fiercer American Indians. Like birds they loved high perches; they were about as cruel comparatively as birds in pecking strangers to death, or in pitilessly killing distasteful members of their own flock; they rose early to worship the sun in high places, (and does not a bird the same?) whereas the Northern Indians pursued the night trail, and prowled about like beasts by the light of the moon. They preserved a singular resemblance in their features and limbs to the shape of birds; and they ornamented themselves with gaudy feathers as their most loved and honourable costume.

Is all this parellellism accidental? It is literally true. And if it helps us to approximate to the truth of the origin of various races, why should we not reasonably entertain and discuss it?

To give one more brief and familiar example of the infinite adaptability and variability of nature and development, no one can see a gray cat and a gray owl,—no one can mark the face, eyes, ears or horns, soft covering and strong claws of each, without being struck by the wonderfully close resemblance of the one to the other! Then, think of the peculiar habits of each, their avoiding sun-light, sleeping by day, catching field or house-mice by night. Surely no one who has carefully studied the minute resemblance which exists between these two animals will think there is any great improbability in believing the cat to be a development of the owl. It

may be that the owl remained a mere owl when man did not require a domestic vermin-killer; when man did want a cat, the cat was betimes developed. At all events, we have now sufficiently ridiculously prepared the mind of the reader to easily follow our lucubrations as we first attempt to familiarize to him a statement of tolerably regular development from that radical member of society, the cell, to the God-like man; and, secondly, to enter more at length into the various differences which accompany, interfere with, improve upon, and supersede this regular development, as the necessity for regular development ceases by reason of any change in the surrounding conditions.

CHAPTER II.

CONDITIONES REGUNT.

Conditions are the Supreme Rule of Existence.

THE origin of plants and animals is much simpler than has been supposed. The granite of our system, until worn away into softer layers, admitted of no vegetable life. As soon as air, wind, and rain washed down enough of the mountain's substance to float in turbid solution and to form layers under the water, the water itself, combined with heat and light, completed the conditions necessary to existence. Given grains of any part of the earth's crust, heat, light and water—vegetable and animal life follow as a necessary consequence.

It is by no means necessary to fix the precise period when the first humble forms of plants and animals began to exist. Possibly they were so frail that all trace has long ago perished. What, for instance, *could* remain of various delicate species of sea-weed we now see, or of jelly fish, if they existed only a thousand years ago? What, then, can we expect of the perhaps humbler and frailer types of being which first occupied

those parts of earth or water which soonest supplied the conditions necessary to life? All we know is, that fragments, apparently organic and resembling the cases of minute, or microscopic water animals, have been detected in the primary rocks, and that the first undoubted objects of a fossil kind are the solid parts of the polyparia, crinoidea, crustacea, and conchifera found in the mica slate and grauwacke slate system, that is in the second-oldest rocks or strata of the earth's crust. The existence, too, of the early fossils prove that lime had been previously secreted by plants from the atmosphere, and had been eaten by the animals whose shells or exuviae we have alluded to.

No doubt the atmosphere surrounding the early earth was too highly charged with carbonic acid gas for land animals to exist in. But plants could exist, and therefore luxuriant land vegetation gradually arose to absorb this gas, and lay it down in coal; and at the same time the corals and other insects of the zoophyte and other such early types were absorbing vast quantities which had mingled in the sea; until at length the conditions of land-life were also complete, and plant-life was quickly followed by proper animal life also. Perhaps we, for life is short to make the necessary investigations, shall never know precisely whether the land had any independent sources of development or origin of animated beings, as the water had. It, however, is most probable that the same law prevailed in both land and water. A careful inspection of Land's End granite (we were previously

conversant with North British granite only) induces us to believe that lichens and mosses are now developing themselves wherever a surface of granite is abraded or disintegrated, and not regularly washed by tides of the sea. In fact we believe that the old progression of certain vegetable tribes may be at this moment seen going on upon any piece of moss- or lichen-covered granite.

The substances and conditions necessary to form a plant or an animal have only to be brought together, and whether on land or in water, the result is a plant or an animal. But as the first conditions were completed in water, life commenced in the water. Absurdly needless mysteries are affected on these subjects, but here, as in other great things, truth is as simple as it is sublime. We can all of us bring plants or animals into existence by supplying the conditions necessary to their life, but it is the fashion to say we cannot, and therefore most people believe they cannot. But they do it; they create both plants and animals nearly every day in their lives.

A gardener produces plants by the thousands; a mason cannot build a wall without also producing first vegetable, and afterwards animal life, as the inevitable lichen, mosses, and grasses develop themselves in, at, and by the disintegrating particles of the wall, acted on by heat, light, and moisture.

A dairy-maid cannot make a cheese and guard it so effectually that mites shall not develop, and convert the whole nutritious pabulum she has provided into multi-

plied types of their own minute organizations. Life is a supremely simple necessity resulting from the supply of various conditions ; from the juxta-position, in fact, of certain natural substances, such juxta-position being accompanied by the requisite amount of heat.

Life began in and by the conglomeration of certain particles of natural substances into a cell, which, as soon as fairly conglomerated into a cell, became possessed of certain new and additional qualities. All nature's conglomerations have certain properties and qualities. Thus, particles of nebulous matter gravitate into a globe-form or sphere ; bubbles of air in a tea cup seek each other ; centrifugal and centripetal force are manifested if any one makes and works a grind-stone. For instance, make of a shapeless boulder a circle like a cart-wheel and turn it on an axle, you *must* have such a machine as will cohere through gravity and throw off, through essential power of propulsion, external atoms placed on its edge, as often as you turn it. Nothing exists which does exist without certain properties ; and no fresh form can be made, no fresh type or conglomeration of substance can come into existence, without fresh properties being also necessitated, without fresh qualities becoming either inherent or evolvable.

Such then is the case with that "radical member of society" the cell. The cell, a little conglomerate of a few simple but various substances, sometimes gelatine, albumen, or some nitrogenous substance, with perhaps a dash of carbonic acid gas secreted into lime, or

some earthy salt,—the cell appears a mere tiny tissue filled with fluid, receiving food through its porous coat, emitting used up water or effete material through the same medium. The learned love to shroud this simple process under the dark appellations of Endosmose and Exosmose. And the cell has other properties. It is essential to a well conducted cell to have within him the germ of other cells. He can if he likes grow a little longer and split himself into two, each of which will grow into a cell as big as he himself originally was, and each of these can again split into two more, and so on. Only supply the food and warmth and conditions generally which he delights in, and the cell will grow and expand himself into larger and various forms. Change his conditions, alter his environments, let him find himself in a sea well charged with carbonated air, and of the lime he will secrete a coat of thicker material. Let him live where nitrogenous substance is more plentiful, he will increase his vegetable fibres. Keep him in a luxuriantly well supplied habitation, and he will show you he has more wonderful qualities still. He only wants the sort of food out of which to become a plant of recognised form; and that plant, say a crinoid, in his turn only wants the necessary food and conditions to detach himself from his binding stalk and enter upon a new course of existence as a free ranging star fish. The time required may be long, but time is one of the conditions, and these supplied a star fish will our crinoid become.

But all cells will not have been favoured with such fostering conditions; many will remain plants while a fortunate brother has sprung up into an animal. But the tendency of all is to advance into a higher type. Some animal plants (zoophytes) constitute a curious link between plants and animals. They are at one time free-moving, and finally fixed to the rock. The little cell-germs, in fact, which are some day to form whole sponges, swim away from their parents, and, after a brief excursion to see the world and enjoy themselves, settle down in a nook of their own, and fix their habitation, as firmly as their parents had done, for the rest of their lives. But fresh material is being constantly supplied. New combinations of earthy, airy, and watery particles are formed as the world advances in age. The cell-property of extension and reproduction, and modification according to circumstances, is endless, and so once set going it never stops in its course of self-development as long as the means of developing itself are supplied by surrounding conditions. The crinoids become star-fishes of many shapes; some of these become ammonites, or shell fish of such names, as once imposed have served to disguise how simple, and how like their ancestors, they are.

But to be brief and simple, the shell fishes closely follow our early shell-less friends. The shell fish alter and modify their frame and structure, so that the skeleton no longer remains the outer covering. Circumstances no longer need the shell, or outwardly worn skeleton, and conditions of life are becoming

more abundant and easy. The shell becomes an internal bony frame, and true fishes begin to swim in the sea. A sea of wondrously developing power makes fish grow as large as whales—as ammonites of huge dimensions are also proved to have existed. The fishes become more and more perfect. The fin, the eye, the stomach and the brain are advanced to a high stage of perfection; and some swimming up the rivers from the sea, as salmon and eels do now, the monsters of the deep surrendered themselves to the temptation of the new conditions of a placid fresh-water life, and soon assumed almost totally new habits and appearances. Sea horses and seals and cow-fish are plainly developments of fishes; and saurians and all those huge monsters which are vaguely styled “antediluvian,” and some of which are exhibited in plaster in the gardens of the Crystal Palace, are, also, mere developments of fishes. In these monsters of the mud slowly emerging from the rivers we see the developing forms of the predecessors of crocodile, hippopotamus, elephant, ox and horse, while in the Pterodactyle (as also in the flying fish) we see precursors of certain birds; and in the polar regions we find seals and bears and other marine animals so strongly fish of fish and of the fish fishy, that we can be at no loss to decide to what their origin is due. The cod and the dolphin, the seal and the porpoise, the cow-fish and the dog, and the bear and even the pig may all be very nearly related together. It is no fanciful resemblance which exists between the seal and the dog. Let any impartial observer view the seals in the Zoolo-

gical Gardens ; mark the whole form, one of the existing links between fish and dog ; observe the seal's intelligent dog-like head, mouth, and eye ; see him spring from the water to the land ; regard him as he looks tenderly and eagerly at his friend the keeper. There is incipient rudimentary dog in every movement, in every particular. A little "nature" is worth a deal of theory. Go and look, and judge for yourself.

But we have said enough of water origin, of plants and animals. Sea-weed and sea-anemones are clearly enough accounted for. They began to be as soon as the conditions to their existence were evolved in the early earth and sea. On land the process was slower ; lichen and moss first probably grew upon worn hill-sides, crept up into grass in the valleys, grew under the luxurious influence of sun, and rain, and carbonic acid gas, into glorious ferns and stately trees. Our ferns now are little else than grass. They were mighty trees, bigger than any that grow now in England, where the coal-forests flourished. They relieved the air of the conditions hurtful to what we understand as animal life. Animal life appeared as soon as the air enabled it to live and feed on the organisms out of which it was in the first instance developed. A cheese develops mites, grass develops insects, plums develop animals we call "bloom." Peas are the prey of a white parasite, which looks like filmy wool. All nature teems with life. The tiniest insect, springing from a drop of rain-water exposed to the sun, is replete with others of stranger forms still. The blue-

beetle has a swarm of parasites between its arms, and they again are the source and prey of others. There is no end to life. It will spring up. It will grow and develop into a thousand forms, as the necessary result of the disintegration of the old granite of which our world's crust primarily consisted.

And thus by slow degrees the granite, or some part of it, become modified into silica ; absorbed into grass ; and converted, according to Deville, into fat of animals, which, when eaten, supports the strength, and is consumed in the lung and pore slow fires of that model steam-engine Man.

There is no mystery in all this. It is a mere necessary concatenation and sequence of events. Granite is degraded. The atoms find themselves dissolved or disintegrated from the parent mass. New situations await them. They act and re-act on the other influences, and gaseous, or aqueous, or more solid matters, with which they are brought into contact. Each atom of every substance has its own elective affinity. It chooses for itself in what proportions it will mingle with other atoms. We cannot overcome the inherent and self-contained chemical power, or, as Dalton calls it, elective affinity, of the smallest atom of that which is incorrectly styled *inert* matter. No matter is inert. The tiniest atom has a will of its own and properties of its own, which cannot be prevented from exhibiting themselves in the normal way as soon as set in motion by water or air, or washed down into the sea. And as each atom is

elective, or has certain powers of choosing its own comate, dreary, dull and silent as the wedding of two little atoms of dust may be, yet such tiny atoms do meet, do marry, and do become sometimes fresh substances, with entirely new properties, as the result of their marriage; or they become plant-cells with digestive and reproductive powers, or they become animal-cells with the power of motion, and perhaps also with instinct, that is incipient brain.

We need not *prove* the elective affinity of atoms. Every one knows that in each compound there is a certain proportion of simple, or apparently simple bodies, which in their turn revert to certain proportions of earth, rock, or metal, which may in their turn be referred to some one of the elementary substances, of which we at present reckon about sixty.

But each ultimate atom is as elective as it is indestructible.

Water contains just so much oxygen and just so much hydrogen.

Granite is invariably composed of two or more of four substances called silica, mica, quartz, hornblende, which associate in it, in the form of grains or crystals, and which are themselves each composed of a group of the simple or elementary substances. Dissociate these elective atoms, float them to sea, expose them to genial warmth and light, some of them, in virtue of their elementary composition and elective affinity, coalesce with other atoms, of such a nature that the coalition is

possible and admissible, just as air-bubbles form in a stream of flowing water, and often enclose minute particles of earthy or vegetable matter. Thus the primary cell comes into being. As its originally constituting atoms were elective, so is itself, only in a far higher and more concentrated degree, because it is itself the higher union of elective affinities, and possesses at once a double share of election, with the adjoined force of a new substance. Just as gunpowder, when formed of sulphur, charcoal, and nitre, is only the union of the three, but possesses the power unknown to any one of the constituents, of instantaneously burning, bursting, propelling and shaking the air to the production of force, light, noise, unsuspected before the elective atoms were brought together. Thus, then, the elective affinities proceed, continually acquiring new properties, new forces, and, in fact, new *vitality*.

Our first great conclusions, therefore, are that all matter is animated; that every minutest particle of matter is animated, and has an indestructible power of exercising its animation, producing new compounds, higher phases of existence, but never by union losing its own nature: capable of almost infinite coalition, of wonderful change, but still remaining true to its original character, and ever reducible to its primary or simple form of existence. Thus, matter is eternal, indestructible, animated, and elective.

CHAPTER III.

Sub lege continuâ, non creatione, vivitur.

“MY FATHER WORKETH **HITHERTO**, AND I WORK.”

WE must now both briefly sum up what we have said, and shew how completely our statements are in unison with natural law before we proceed to our next approximations.

In the first place, we have no fortuitous concurrence of atoms, but strict undeviating law.

Water degrades rock by law.

Grains are washed down into the sea by law.

By law atoms possess elective affinity.

By law currents move, and heat warms atoms, and laws of affinity, of heat, of attraction, of coalition, produce a cell.

Law enacts that cells shall have new and peculiar elective affinities, and peculiar energies. Cell-life is strictly according to law: and all life is cell-life. Cells began to be when granite had been disintegrated and washed down into water. The same process is going on

now. Let a quarry be opened, and the stone within it be exposed to air and rain, the conditions of life-cells are completed, and minute cell-plants are formed. These, in their turn, supply the conditions of animal life, and animals enter upon the scene. The animal thus formed gradually progresses from its original cell to that wondrous mass of cells—man. Man is merely a mass of cells, combining in one grand compound the atoms of earth, water, and air, which first formed vegetable, and then the animal cell-life.

We would, however, enter a preliminary protest against being misunderstood when we say, that a cell in time, and under favorable circumstances, naturally develops and grows into a crinoid, a crinoid into a starfish, and so on, from link to link in the mighty chain, whose present extremity is man. We protest against being misunderstood to say that *every* cell thus progressed or progresses. We do not urge, or even suppose, that this development was, in all cases, carried out. Nay, we cannot by any possibility positively prove that any one cell did thus develop through plants into animals and man. And yet our approximative generalization is that something not only not unlike this gradual upward development, but most probably just such a development (because if not this, there is no way left for a reasonable observer of nature to solve the problem of existence) has actually occurred. We feel that, in many cases, cell-development may have been, and may be retarded, stopped, injured, ruined. But we are sure, from

the general indications throughout the vast fields of natural observation, that this generally upward development commencing with cell-life, upon the disintegration of granite, affords the only true solution of man.

The earth proves it. Man and early tradition prove it. A heap of inductive evidence proves it. The earth by geology, by the secrets of her bosom laid bare, proves that at one period plants only, and, at another, humbler animals only existed; then that shell-fish came—whence? from the absorption of shell-material into cell-life. Then came true fish, then animals and birds, then the highest mammalia—and man. All this is abundantly proved; but man himself is a still stronger proof of his own humble origin. He consists simply of an immense mass of cells; his flesh, his bones, his blood, all are cells, and depending on cell-reproduction for their united existence. He grows by endosmose and cell-reproduction like a vegetable. He declares his close affinity to the animals by retrograding under unfavourable circumstances into animality, and he occasionally stops short at some animal stage, where strength is lacked for the more perfect development of the human embryotic-cell into the highest attainable form.

Chemistry proves the same conclusion—for man consists but of natural substances, chiefly known to chemists as carbon, oxygen, nitrogen, hydrogen, and all those constitute a cell, a plant, and an animal also. Thus, as

geology, as physiology, and as chemistry, all prove the atomic, the organic, the cell-like, and the gradually developing nature of plants and man, so also does man himself, by every voice of antiquity and tradition, prove the same series of facts.

We could inflict on our readers heaps of learned quotations to prove that all antiquity conceived an early animal stage of man, when the race “crept” like brutes on the earth; when the acorn, and mere forest produce, was human food—when the earth was wild and drear and untilled. Then, they tell us, that some benevolent genius shewed men how to grow corn, that another God-like individual brought “fire” from heaven, that a third invented wine. But even in the days of Ceres and Bacchus, in the days when the “earth-mother” (Δημήτηρ) first developed corn and grapes, there were semi-animal men living together with more perfectly developed human beings. The fables of the Centaurs, the Satyrs, the bird-births of some, and the bull-origin of others,—nay, the beautiful legend of the mother of love, the perfect woman, Venus, arising from the sea, all point to early but universally received traditions, which are explicable on no other supposition than the animal development hypothesis. Was not Juno ox-eyed? Did not Europa rival Pasiphae in affection for a bull? Were Sirens, Sylla, and “Chimeras dire” no realities to the men of old?

It is likely to shock many, or we could prove from the Hebrew Scriptures, that carnal affection for animals

had to be rigorously stopped; and any reader of Herodotus, the father of history, will be familiar with the Egyptian idea of animal origin, both of gods and men. In fact, the Egyptians worshipped animals as gods, because they explained the fact, in their day less contradictable than now, of the animal origin of man, by teaching that gods must have been latent or concealed in the animals which they all believed to have subsequently become men. And, as in all early times, they worshipped as divine the names and memory of their departed great men; as in Egypt and in Greece we see general and unquestioning reference made to some early animal stage of man; so in Rome also, the divine Romulus was worshipped none the less because he was reared by a she-wolf. The harpies of Virgil *may* be our cormorants, but the Romans saw nothing incongruous in harpies, sirens, and various monsters, half marine and half human. The Hindoo traditions also refer to brute existence as the very base of the world's foundation; they teach that the world rests on elephants and tortoises; and many Indian idols consist of down right monkeys (just as the Egyptians worshipped other animal progenitors), and of misshapen, uncouth figures which represent nothing if they do not portray the hideous ancestral forms of some Asiatic links in the great and diversified chain of animal existence.

The portrait, which appears in an *Illustrated News* of 1858, of one of the living kings of Siam, is not, to us, less hideously revolting than many Asiatic idols; and

there is little doubt that the distorted and shapeless forms of most, if not all, Indian idols had their foundation and their origin in actual fact. Again, are there not numerous indisputable proofs that in England lions, tigers, hyenas, and all kinds of now rare animals abounded? Are not the bone-caves proof positive of the fact? Where are the animals now? Where are the lions and bears of Palestine? They must have been very common when David killed a lion and a bear, and another lion ate the disobedient prophet, and two powerful she-bears killed forty-two young people at once. Now, why are none of these animals in England or near Jerusalem now? They have been superseded; the very conditions which produced them, viz., a superabundance of herbivorous animals which accompanied a luxuriant vegetation, also tended to *develope* them, and from them other and higher races into which they were absorbed, or by which (as in Edgar's times) their few remaining representatives were killed off, and their places occupied. The British lion, then, may be no absolute fiction after all. The French used to say he was a leopard, and they themselves refer to a national eagle, and though we, ironically repeating their own more ancient ideas, may jestingly profess to see a humbler origin for them by translating "*Gallus*" a cock, yet one truth underlies all our statements. We all unconsciously, of our own natural accord, refer to some animal origin or other—lions or leopards, eagles or cocks—we point to no man as our ancestor. In fact, we agree with

old Egypt and ancient Greece, and deify some ancestral bird or beast, from which we are proud of descending, and by whose names we still delight to be recognised.

No Athenian Autochthon, no son of the soil ever valued his golden grasshopper more than an Englishman likes to be known as a sea-lion; or than a hawk-faced Napoleon III. delights to contemplate his eagles. The savage Indian, as Cooper tell us, names himself after some fierce beast. And when we go to the root of the matter we find the polished Athenian agreeing with the Hebrew generationist, the one claiming to be of the very soil, even as the grasshopper, and the other authoritatively informing us that man was originally red earth (Adam, as the sea of *Ædom*, or Edom, is the Red Sea); or as we now commonly say—"Man is clay." Man was first *clay*—earth-sprung, plant-born, animal-reared, to again return to primeval atoms. "Ashes to ashes, and dust to dust!"

CHAPTER IV.

Origin of Man ; of Sex ; and of the Varieties of Man.

“ PRECEPT UPON PRECEPT : LINE UPON LINE.”

MAN is a development of some animal species ; and as there are various kinds of animals, (we here use the word to mean mammals or birds) so variously formed and disposed men have come into existence.

Almost infinitely varied circumstances help to modify the human being : origin, climate, soil, food, enemies, neighbours, laws and customs being the principal. But whence does man actually come ? It seems at first sight as difficult to decide from what animal any one man has sprung, as to determine from which particular particles of stellar nebulosity our planet has been condensed. But as there is no other material, within our circle of gravitation, from which world or man could have been made, it is clear to demonstration, first that the world we inhabit was once immensely more expanded, and at another time immensely hotter, and then colder, and only gradually prepared for the growth of plants and animals ;

and secondly, it is equally clear that man is only a development of animal progress. Or to be brief, the present earth is the result of mundane development, man is the consequence of animal progress. Else why is man the latest animal on earth? Where are the fossil remains of man in the primary or early strata? Where are any traces of such former existence?

None can be found but in comparatively recent formations, simply because man is the last production or development of nature. Indeed, though many transition races may yet be discovered in recent formations, or be engulfed beneath what are now seas, formed by the gradual elevation of some lands and the depression of others, no change either igneous or cataclysmal sufficiently sudden to engulf or fossilize en masse any large tract of man-inhabited country has occurred since the development of man. The event then of man's development is evidently very recent, in comparison with the age of the world. For instance, as the globe was at one time probably 350 millions of years merely cooling sufficiently to produce a moderate temperature at its surface, and as all geological formations—the Weald, for instance, or Mount Jura—have been millions of years in process of formation, so it is equally certain that comparatively thousands of years only can have been occupied in the present development of the human race. Even works of art in the drift, skulls at the roots of American bog-forests 57,000 years old, or Egyptian pot-

tery 13,000 years of age, point to periods separated from us only by thousands not by millions of years.

Geology proves the recent origin of man, as it proves the intense antiquity of the planet he inhabits. Geology also proves the gradual development of plants and animals into higher and more complex organisations, and though under peculiar circumstances some little animal may seem, probably through error in classification, to have been occasionally developed with a singularly high organisation compared with its ordinary compeers, yet the rule of nature was and is slow gradual development until fish passed into bird or saurian reptile, (being at the same time *continued* by countless developments of more lowly orders into fish,) and some birds and reptiles passed on to the form of mammals; and at the same time also some fish were directly developed into mammals, as the whale and cow-fish and some others. So that the horse in true origin sprang from the sea, as the Greek worshippers of Neptune fabled of old; and the satyr was father of the *man*; and the ape, the horse, the goat, the lion, and even the sheep his undoubted progenitors. Under adequate circumstances there has been no stay to this development. Even birds have a tendency to develop. The Cochin China fowls are making strange strides to the form and type of man. In America the fact is accomplished. Many Mexican tribes are bird-sprung, and to the times of even European civilization have preserved a strong family love for

garments of feathers, and a strong family resemblance to bird habits, as we have noticed elsewhere. The slim-legged, abdominal, and deer-nosed Australian is kangaroo-sprung. He truly calls his marsupial progenitor, the *old man* of the woods.

In the vast forests of Asia the jungle admee, the *wild man* of the wood, is evidently the principal link between man and beast.

In the large white apes of India we have perhaps the progenitor of our own Caucasian race.

In the Gorilla of Western Africa we have the not very remote relation of the warlike ladies of Dahomey and other savage African tribes. In the lion of the south, we trace the origin of the Caffres ; and in the same aboriginal native of North Africa, we trace the origin of the fierce tribes of old northern Africa, soon, however, fated as a human race to succumb to the influence of a climate which is as fatal to the excellence of mankind as cold is fatal to a tropical beast. But many animals acclimatize themselves to different temperatures, especially ruminants, so that the descendants of sheep or goats or cows will flourish more generally than lion or tropically beast-sprung races. The ease with which one tribe preys upon another marks their different origin, and if we could endure the climate of Africa we might soon make the necessary observations to distinguish the origins of various races. However, Africa is the home of the negro, as it is of varioussimiads, which even, when boiled for food, puzzle travellers, and induce them to think that

one black man cooks and eats another. Some ape, then, Gorilla for the fierce tribes, goat-sprung ape, dog-monkey, sheep-monkey, some ape or other has supplied the material for the negro race. Then it is certainly possible that in process of time a negro would develop into the Caucasian type, through the successive stages of Malay and Mongolian ; but there is no necessity why such a chain must occur. Nature can produce her children in more simple and direct lines of descent. The white ape or other indigenous simiad of Asia may much more directly develop itself under favouring conditions into the Indo-Caucasian type, just as in the vegetable and animal worlds of different zones we see certain species easily and quickly assuming a high and definite type, though surrounded by hundreds of more humble varieties, which are painfully and slowly toiling onward at an immense distance from their more highly favoured competitors. Look at the whale among fish—a mammal by anticipation, and nearly all other fishes oviparous. Look at the bread-fruit, the custard-apple, the banyan, and the palm, anticipating the produce of the corn-field, the dairy, the garden, and the tallow or oil-giving animals. We believe then that any animal, however humble, may, under favouring conditions, continued long enough, develop into man, and into the highest type of man.

We hold that what is called instinct in animals is but the incipient brain of man ; and we believe that instinct is no more unerring in animals than intellect in man. There is a huge fallacy in ascribing any extra-

ordinary perfection to animal instinct. Generally animals act in a certain way; individually they commit as many blunders, suffer as many evils as any other production of Nature. A plant turns to enjoy the sun, rejoices in a genial shower, and delights in the breezy zephyr. An animal does the same. And both seek to satisfy the desires of their constitution. But thousands of flowers wither in spite of their capacity of enjoyment—thousands of animals succumb to poisonous food, inclement weather, deficient nourishment, accidental violence—from which no exercise of natural craving or instinctive fear can relieve either. “Conditiones regunt.”

The surrounding conditions and circumstances rule each as with a rod of iron. Some progress, many die; some barely exist; some develope—on, on, on, into man.

All may not, do not, reach the goal of their ambitious tendency. But many higher species of animals do, and the numerous races of men are the results.

The only real difficulty that we feel in the matter is to account for the commencement of separate sexes. The great mystery to us has been the origin of genders. When did cell-life cease to be self-reproductive, and when did generation proper fairly commence?

On this question we have pondered long and deeply, and we will spare our readers the process by which we arrived at the following conclusion. We do not, of

course, lay it down as final, but until a better exposition is discovered, we shall hold it to be the true one.

It may be briefly stated thus.

Sex is the consequence of accumulated elective affinities.

Atoms are elective. Cells composed of various elective atoms have accumulated powers of electiveness. Cells have, to use a logical term, a property derived or flowing from their superior electiveness (*i. e.*, from their higher organization) to reproduce cells like themselves. But, as another property of reproductive cell-life, the cells, under certain favouring conditions, have an inherent power of plant-formation or development. Developed into plants, new energies are evolved by virtue both of the increased development and of the new atoms which each plant is enabled to absorb. The result of these fresh accumulations is that the plants reproduce themselves, *i. e.*, give birth to other plants, just as cells produced other cells. Plants reproducing plants from themselves are called hermaphrodite, *i. e.*, they contain the elements of both sexes within themselves.

But plants develop into lowly animals, and these lowly animals, such as worms and land crustacea for example, are also, like the plants, hermaphrodite. However, the law of accumulated electiveness proceeds with ever increasing force, and these lowly worms, though formed hermaphroditally like plants, yet *uniformly pair* and exercise the true operations or functions of distinc-

tive sex. Animals begotten thus soon lose the original plant-like or hermaphrodite formation, and true sex is gradually formed.

It appears that only under certain conditions these organs of reproduction are so modified into what we understand by sex; for, in many highly organised animals, as in the higher fishes, the sexual arrangements are still very rudimentary. However, in the bird, a developed fish, a more true act of generation is engendered, though the result is still partially oviparous. In the bat tribe the development seems to permanently change, and, in the succeeding developments, into true rodents, sex is fairly established. Still the conditions of Nature are as infinite as Nature herself, and though she may occasionally attain her end in fewer and more rapid strides, yet in the majority of cases the completion of sex must involve a large number of slow and, as it were, experimental essays and developments. The ant and bee generations are examples of the latter, and the sudden progress of seals, cow-fish, sea-horses, into dogs and other mammals, exhibit to us examples of the former.

To re-state the question of sex as briefly as possible.

Cells are simply reproductive:

Plants are hermaphrodite.

Lowly animals, such as worms, and even land mollusca, are hermaphrodite, *but yet uniformly pair*;

Higher animals only pair.

What a beautifully harmonious progression of development we have here exhibited !

We may now proceed to some closer considerations concerning man and his generation.

Man is, as we have in effect said, the last grand development of the law of elective affinities, which were first shadowed out in the facts that only certain proportions of seemingly inert matter would mingle together. Those latent powers of stone, of metal, of gas and heat have evolved apparently wondrous but in reality strictly consequential effects, and man is one of these effects. He is the most perfect plant, the most sensitive animal, the most intellectual being on earth ; and yet, before his parents begot him, he is a mere organism, containing some germs of life, but only one part of the conditions necessary to life, which, after mingling with another similar germ (just as primeval atoms met together and united to form the first cells which grew into plants and animals), forms by the unison a proper Life-cell, which with the required conditions, supplied by the material frame, shall, in the space of nine months, perform the marvellous development which labouring nature was originally millions of years in completing ; and the life-cell shall in nine months pass through the reproductive cell stage, the plant stage, and the animal stage, the heart and brain of the embryo rapidly going through the stages peculiar to fish and reptile, until the true mammal type be reached ; and then another wondrous development takes

place in the case of any member of the Caucasian race. The mammal brain becomes that of the ape or negro, that of the negro goes on to that of the Malay and the Mongol, and then only, after all these stupendous developments have been traversed, does the Caucasian type of head and face appear.

It is the culminating truth of science that man reproduces in himself all that ever has been since our world began.

To the scientific generalizer of the truth of science, this conclusion is inevitable. Generations of savants devoting themselves to single points prove each fact in detail, and then the faculty of generalisation comes in to the aid of all, and makes one harmonious whole out of the almost innumerable beautiful truths which science has elicited.

Let it not be imagined that any one system is herein attempted to be inculcated. The developments of elementary atoms are felt to be infinite. Only a few developments have been here, for brevity's sake, attempted to be traced out. Endless objections may be made even to these, and minor points of detail may often be proved erroneous. But the chain remains substantially strong. The facts are before us. A little rust and moss may make some links of our chain look rusty and weak, but it will bear being stripped of all incrustations and defects.

Man *does* contain and represent everything, from a

primeval plant-cell up to himself. He may be delayed at any of the intermediate stages.

Those who would continue single may decline to marry, and so refuse to complete the conditions necessary to producing their kind; but they have their share of the conditions in their control, to use or neglect. Again, a wife may die a few hours after the consummation of marriage. The germ of another life dies with her. Or she may carry it forward to almost any type, and through weakness or imprudence or illness miscarry, or produce a "monster" or "prodigy," *i. e.*, something delayed permanently in an animal or lower type. All this often occurs; and brains have been examined at almost every period of gestation. We know the human brain only arrives at perfection under certain favourable circumstances, *i. e.*, when all the conditions requisite to its full development have been supplied. Many children even of true Caucasian parents are born of the negro type of brain, many more with Mongolian heads, which last, if innately strong enough, frequently carry on their own development into Caucasian, if proper conditions be supplied after birth. Many men are all their lives wholly animal and brutish, others are fishy and weak, some combine much bird-brain with an approximation to the human figure. The writer of these lines has seen numerous brutes, fishes, and birds—(no one living in town between 1850 and 1858 could have failed to see *the bird* and his bird mother who hopped about in all

fashionable localities with their huge bills, no chins, and bird-like throats and heads), and he finds the solution in the scientific facts that organisations of men may be retarded and modified, and delayed and belated at almost every stage of the chain of animated being.

Medical museums shew the human brain in almost every embryotic stage. In one glass case we may see the brain from an infant's head, corresponding with the brain of a full grown cod-fish. In another, we see the heads, legs and shape generally of true negro formation, though the parentage was unquestionably English. And we see the brains of men whom we call idiots—brains, that is, which have never been properly developed, and which in general lack frontal and crown brain, though the cerebellum or region behind the ears is sufficiently developed for a certain perfection of animal organisation. Compare the heads and faces of one of these partially developed human beings with the well known head of Humboldt, and you will not need the aid of Spurzheim or Combe to tell you the one *must* be idiotic, the other a grand and noble specimen of manhood.

Thus, then, even though the world has produced a Bentham, a Combe, a Mill, a Washington, and a Humboldt; it can also, when the same existent conditions are varied, produce a Paap, a General Tom Thumb, a Rush and a Greenacre.

“Infinita, ut est Natura, ita est Progressio!”

CHAPTER V.

A controversial, somewhat personal, and decidedly monkeyish Chapter.

“UTERE JUDICIO TUO.”

ALTHOUGH we have fairly introduced Man in the preceding chapter, we do not wish it to be thought that we are about to so briefly dismiss, as to seem to shirk, the vexed question of his more immediate origin. Lady-loved preachers, the Rev. “Dr.” Cuning for example, teach, but do not prove, that it is impious to consider man an improved monkey. We submit that this is not a fair way of stating the connection between other animals and Man. No men but preachers back “Genesis against Geology,” or confound scientific statements so perversely, as to induce their simple hearers to imagine that any scientific writer ever argued that any particular monkey could become like one of ourselves.

The distance between monkey and Anglo-Saxon, as we understand the two appellations, is too enormous to

be conceived of as even likely to fall within the possible personal cognizance of individuals, and, therefore, it seems, to minds unaccustomed to consider geological periods and mundane changes, almost an impossible notion. But there is plenty of time in the operations of nature (though not, perhaps, in those of a gentleman who is making a fortune to spend before the ever-closely approaching though ever-slightly deferred final catastrophe) for an ape to slowly approach the humbler types of humanity, and for these humble types to develop into higher; and, philosophically, the chief question to be considered is the following:—

Is the evidence, that apes are structurally different from men, sufficient to prove that there is no connection between the races of apes and men? Various great natural philosophers have pointed out slight specific differences between some apes and man, and have hence concluded that there could be no nearer approach between the species; but all apes are not yet known to us, very few have been examined; those that have, seem to lack only part of a shoulder-bone or some very slight addition. We require further knowledge, in short, a full acquaintance with every kind of ape, before we can pronounce such an opinion as that all apes hitherto examined are hopelessly different from man. Judging for ourselves we doubt not that posterity will look upon museums of human forms commencing with Man, and tracking their downward way through the white ape of India, “strange baby” of the Eastern Archipelago,

or gorilla of Africa, and demonstrating how each race, we now know as refined, or warlike, or cruel, or savage, does but carry on the instincts it originally possessed in some humbler and more decidedly animal form. I fear me the wolf, the lion and the horse are not yet quite modified even by centuries of human circumstances, in our most civilized communities, and in the highest and most favoured of all earthly races. And yet how grand a change has come over human society in the last 1,000 years! What was the value of human life when Egbert ruled some Saxons in Angleland? What were the habits of the most civilized even of the dominant race? It was not safe to drink without special provision of safeguard, and perpetually renewed contract that the man engaged in quaffing his metheglin should not be slyly stabbed by the man he caroused with! Blood was spilt like water, as deer gore deer in the rutting season, as dogs tear one another, as bulls rush to gore anything from a red rag to a man. And a century or two after Egbert, even when the wise Alfred's laws had been promulgated, we find a Christian Bishop, that meek follower of Christ, the holy St. Dunstan, slashing the face of England's Queen, holding her over a pan of sulphur, and finally hacking through the muscles of her legs and leaving her lingeringly to die. Nice times these!—and not a thousand years ago. And the fine old Norman barons, too, up to whom the proudest nobility of England look back with veneration, were these men much better than wolves when a prey had to be hunted down, or blood

was to be shed? England, in Stephen's time, was a field of blood, checkered with baronial hells for the torture and destruction of the weak. But we will not prolong the painful story. Let us advance to the present moment and contemplate the change of the descendants of these very barons. Gunpowder, navigation, commerce, printing, and the increased hereditaments of educated brain, have told strongly on the once savage noble. He is a talking, persuading animal now. He flatters the "mob." He aims at "garters" rather than blood. One noble earl helps a pill-vendor; another lends his name to a money lending company. Many noble earls engage in trade, and if they or their friends and nominees of the "other place" still lust to spoil the "base churls," as in the good old times, they no longer make armed raids to rob and harry us, but they (vide Bright) send the tax-gatherer collectively, or (vide newspaper) set up a bank individually, or blow up some noble bubble delusively, which transfers our gold to them; but they do not kill us and our sons, and appropriate our wives and daughters, as in Stephen's time. Things are much improved now, thanks to gunpowder, brain, &c. &c. But the animal, the "old man" in us all, still exists.

It is latent, and lurks in the best of us. And in those who have, even among us, and of us, and on our very left hand, been subject to less ameliorating conditions than we have, the old wolfish love of slaughter still burns as savagely as ever. Look at Ireland and

its "bould pisentry!" Ireland, the *Times* tells us in one column, is perfectly tranquil. In the next page of the same imperial journal we read "another dreadful murder in Ireland!" And it goes on to tell us that the gentry in Ireland are meeting together and asking one another "Who is safe? when such a man as this is assassinated!" and we are told that the secret society men march 200 in a band at midnight to plot their murders and receive their orders whom next to dog and mangle. Oh! the old Celtish wolf is not dead. He still prowls by night; he is still "bloody, wolfish, starved, and ravenous." But these are mere coincidences, mere ridiculous comparisons. For where is the link between a wolf and a man? To this I beg to reply, that though I am sure such links have existed, yet I am happy to think they have passed away, and been superseded—many probably ate one another—and the few that are left had better modify their wolfish ideas, or they too will inevitably destroy one another, or suffer the fate of their last *Welsh* brethren, when Edgar the peaceful was king, and objected to man-killing and flock-harrying.* A well known character once wished that Ireland could be engulfed in the sea for twenty-four hours. He must have argued thus. It seems cruel to extirpate any animal. But what can be done? Are the inferior few to be allowed to destroy the superior many? Edgar thought not, and wiser than the bear-tribute-makers of

* See the "Observer" of January 15, 1859. Irishmen killing sheep by the dozen wantonly and cruelly.

the present day, had his wolves heads sent him *instead of money*: not gave money for destructive beasts which it profited a few Canadian speculators, in a more advanced age, to propagate for head money.

“But our link, sir, we ask for a link, and you wave a fiery torch over unhappy Ireland!” Well said, sir. *Ireland!* land of unbridled passion, unchecked rage, and anger. You see much of the monkey remains in me. I sport and mock even in things that should be solemn. But the fellow-feeling excited by monkeyish thoughts brings me back. I would not, if I could, produce you a link between a Celt and a wolf, or a Celt and an ape (though I have seen some fearful specimens of both about St. Giles’s and near the Angel at Islington); but the age of Celt-apishness being too remote to now furnish general examples, I will go further a-field, and will give you at once a more astounding and more noble link—a link between the lion and the ape. The lion developing into man. The king of the forest and the plain developing into the Lord of Nature. Only *a* link, mind, not *the* link. There are many other links in this stupendous chain. *A* link is the gorilla or lion-ape of Western Africa. Its head is very like a man’s. Its arms are almost as strong as a lion’s. Its teeth are a modification of the lion’s fangs. Its habits are gregarious, carnivorous and fructivorous; its courage is lion-like; its body is covered partly with skin, partly with hair. It is a lion-ape. Its descendants, if civilization leaves them room to live and develop, *will be* fierce men. Old

Hanno, of Carthage, was cognisant of the existence of the gorilla some 2,300 years ago. A few years since Dr. Savage, travelling in West Africa, found the upper part of a skull which the natives had been worshipping on a pole. Perceiving at once that it was much larger than that of a Chimpanzee, he obtained it with considerable trouble, and forwarded it to Professor Owen for examination. The Professor at once recognised it as that of the lost gorilla, and from the upper part of the skull described the remaining structure of the animal so precisely, that the arrival of a complete specimen verified in a most extraordinary degree his scientific prediction. Now here is a link existent 2,300 years ago, of which only two men have since been cognisant. At last we have an entire specimen, in sufficient preservation, to prove not only that Hanno and Owen were both correct, but also that the mere absence of knowledge of any particular link is no proof that many such links may not also exist. This may not be the immediate development of a lion into an ape-lion. Several stages may have intervened between the days of Hanno and Owen ; but no one who judges fairly of the facts thus offered can deny that this gorilla is a development of the lion species into a lion-ape, a near approach to man. Mr. Bartlett, the gentleman who lectured on the gorilla at its first exhibition in the Crystal Palace, evidently felt that much might be said in favour of development from the comparison of the gorilla with lion and men ; for he very pointedly, and

otherwise very needlessly, argued against any such hypothesis. If he had had no lurking doubts, if he had thought no doubts would arise, he need not have gone so far as he did to preclude such ideas as that there was no proof that "birds developed into apes." I quote from the report in the *Observer* of November 14th, 1858, of his lecture: it makes him say, and he has never denied it,—

"Mr. Bartlett then adverted to the progressive theory of development. He declared it as his opinion that each species was perfect, separate, and distinct; *that the link between an ape and a bird had never been discovered.*" He asserted, in conclusion, that when the subject of progressive development became more discussed, it would be found absurd in theory, and opposed to reason and experience.

Now this is begging the question altogether. Who ever said that *the* link between an ape and a bird had ever been discovered? No one, so far as I know, except Mr. Bartlett, ever talked of *the* link between apes and birds. There is no *one* link between any two species; but so far as investigation can be carried, the links appear to be very numerous.

For instance, a bat might become a mouse, a rat a rodent of any sort, without being *the* link between an ape and the bird itself. But, as bats are of various sizes and live in various climates, and many in various climates, and under various circumstances, developé into animals of which, in their intermediate stage, we can

have no personal cognizance, simply because we could not exist in the forests and swamps they occupy, it is impossible to deny that bats may develop into animals which, after *many* progressive developments, assume the monkey type. In Australia and the Eastern Archipelago, the bats are flying foxes. The small kangaroo may come from the one, a monkey from the other.

There is distinctly a monkeyish expression about the faces of many varieties of the bat ; and the rudiments of the ape's long fore-arm are developed in the wing, and the other changes are no less wonderful than those which must be undergone in the possibly more direct process which Nature adopts, in New Zealand, of developing a wingless bird (the moa), or, in Australia, of developing a duck-billed rat (*Ornithorhyncus Paradoxus*). The mistake of men like Mr. Bartlett consists in limiting their reasoning to the ideal proposition that Nature must be presumed to have only one way of arriving at her proposed or latent aim. But it amounts to downright disingenuousness to lead away people from the facts deducible from the gorilla, by attempting to divert credence from the development-hypothesis altogether on such a ground as that "*the link between an ape and a bird has never been discovered.*" I cannot too markedly expose this specious kind of argument, nor too clearly warn all unskilled in controversy against being led away by statements which only seem to bear upon the question. Deny his premises ; state at once "no one said there was *one* link only between bird and

ape," and you destroy his whole chain of reasoning. It is the old game of setting up a man of straw, and then knocking him down or pulling him to pieces.

We will adduce one more instance to show the fallacy of Mr. Bartlett's line of argument.

I see the hand of man in the fin of the whale ; so do many learned men. But shall I, therefore, say " there is *a* link, some *one* link, between the whale and the man?" or shall I deny that there is any connection between the whale and the man, because Mr. Bartlett's assertion seems incontrovertible? Not so. I see a whale and a cow-fish, a seal, and a host of other fish, go on developing into river-horses, sea-horses, and saurians, and these again into rhinoceros, elephant, tapir, horses, dogs; and I see these and many others again, by slow links, ascending to man—some of them all but losing the whale's fin, and clumping it up into a hoof, others expanding it into a wing, or contracting it into a claw. But it is there. I track up my hand, my eye, my brain; I never lose sight of many essential points of agreement, all improving and tending upwards, when the conditions are favourable, until man is developed. But I see no *one* link; I see nothing I can lay my finger on and say, this is *the* link between man and whale, or ape and bird.

This is the fallacy, the stumbling block, which fearful philosophers, and trembling divines, who know not half the grandeur of the Universal Lawgiver, throw about in the way of humble and too deferent enquirers.

But now let the report of Mr. Bartlett's lecture give us some more information about the lion-ape.

"The gorilla is certainly superior to the highest description of monkey, but it is still greatly inferior to man, the distinction being observable, not only in its countenance, but in its entire inability to stand upright, the length of its arms, and the clumsy formation of its hands. The difficulty of obtaining it is not only attributable to the dense forests in which it lives, but to "tzetse," a peculiar fly, which abounds in the swamps that surround them. Whenever the hum of these flies is heard, every animal but the gorilla instinctively flees away. The insect buries its eggs in the skin, and these eggs breed maggots, which eat into the flesh, and cause inconceivable suffering, and as there is no protection against their attacks, they are sufficient to depopulate the country in which they swarm."

It is clearly impossible for any of us to live in these "tzetse"-producing districts, so that, whatever the future development of the gorilla may be, it must, in its present locality, proceed unobserved. But it appears none the less certain to me that the tribe of gorillas, of which the Crystal Palace specimen was a member, will, by degrees, migrate into less troublesome latitudes; that it will march about like horses in America, or apes in India, and during its marches will light upon and settle in more comfortable regions, from which it will, in time, come forth, in some form of the African negro family, or in which its more developed representative descend.

ants will be found by some future Hanno or Livingstone as a fierce or perhaps cannibal tribe, or even, it may be, modified into the semblance of a Caffre-race, which keeps up so much of the lion and the ape in it still, as to devour any amount of beef or other flesh daily, and to steal whatever it can lay its hands on.

CHAPTER VI.

Transition-Man—Negro, and the Inferior Races.

“LIGHT! MORE LIGHT!”

I HAVE asked myself why no remains of human beings in the transition state have been found or registered, and after patient thought and not a few years reading, I have arrived at the sure conviction that several causes have prevented any thing like the formal or constant registering of any such remains.

First, Ignorance.—We are only on the threshold of geological science. We have but examined a few bits of the earth. Besides, very few people know what remains they see occasionally dug out of the earth. Such remains are generally dug up by ignorant labourers, and rarely seen by any one who has any idea of transition periods or progressive conditions, and who,

therefore, at once says — “Ah! monkeys! beasts! bears!” or “old Britons,” when, in reality, he may have something between any two of the above species before him.

Secondly, Prejudice.—Many a semi-scientific discoverer of old bones cannot realize the fact of anything happening contrary to his preconceived opinions. If discovered remains are mammoth’s or saurian bones, and he “goes in” for “giants,” he will have them to be bones of giants. If he don’t wish them to be bones of giants, he declares them to belong to huge beasts now extinct.

And who can contradict him but Professor Owen? and Professor Owen is far too careful and too respectable to pronouncedly contradict any “pious” ology.

Thirdly.—General apathy on the subject. How many can each of us name who have ever tried to prove or disprove the development theory by fair and extensive appeal to fact? or how many have ever tried to find specimens on a large scale?

Fourthly.—Neglect to investigate strictly such facts as do present themselves. For instance, we read in the *Illustrated News* of London, of August 7th, 1858,—“In the course of the excavations now being made for the foundation of the Westminster Palace Hotel, there were found, on Friday week, four human skeletons, imbedded in the earth at a considerable depth.” What scientific man examined these skeletons? How can we know they were such skeletons as we should make? All we

can be sure of is that four skeletons or sets of bones sufficiently resembling human bones to induce the excavators to declare these "human skeletons" were found in one place. It may be that many skeletons of early human beings, some in a transition or developing form, are to be found all about us, and we continue totally ignorant of the fact. Still, as no great disturbance of the earth has taken place for a considerable period, it is equally probable that the bones of most animals in a transition state may have decayed on or near the surface unnoticed and unmarked, rotting or decomposing where they died. Again, the early abodes of transition-men or other links, may now be sunk beneath, or the species themselves have been consumed in, oceans, seas, or lakes, which have usurped their places gradually enough to allow the safe retirement of the surviving and expelled Flora and Fauna to the gradually upheaved vicinities. But of all these changes, any one of which is at least probable, we may be totally ignorant, just because we have not yet taken the pains, or hit upon the means, to discover them.

We have seen several coal-shafts sunk in Staffordshire; we have seen basket after basket of material drawn up from the bosom of the earth; we have remarked singular trees and leaves vividly imprinted on the coal and superincumbent masses as they were brought up from the pit's mouth, but we never saw a miner pay any attention to such "rubbish," and we never saw a superintendent of a colliery, or heard of a

proprietor, (and we knew many of all these,) who stored up such curiosities, or would have examined into the past history of any amount of impressions or curiosities, save indications of coal or iron-stone, which the narrow boring of the shaft occasionally sent to the surface.

Near Caistor, in Lincolnshire, too, we have seen great disregard paid to many striking animal curiosities embedded in chalk-pits.

In short, we are fully convinced that no adequate survey has yet been made, which can enable any one to deny the development theory, and pointing to the irresistible evidence in favour of the truth of such a theory, pointing to the fact that if we reject this solution of the mystery of humanity, we have positively no other than that of an infinite and ever continuing series of miraculous creations; while we do not seek to force this theory upon any one, we humbly conceive ourselves entitled to say that, we believe that the earth not only does not disprove the theory, but, *as far as we know*, especially from geology, does fairly prove that a regular progression of animated forms is plainly observable from the earliest times to the present; that first the cell, and, secondly, a cell-formed seaweed appear to be the roots of being, and man their last offshoot, or development; and that no other real or probable solution of the origin of mankind is left us, even though the present apathetic, ignorant, or prejudiced field of observers has produced no absolute proof of the actual development of a beast into a man. Such is not what we contend for. We con-

tend that there has been a very gradual development, so gradual, and extending over such a length of time, that no one generation sees much of it; and we contend for this, although we are fully aware that the centuries, during which printing has increased our power of communicating impressions, have, through ignorance, apathy, religious prejudice, and sheer want of observation, tended to help the demonstration of the truth but very little. Still, this gradual development is going on, and will, in the end, tell its own tale. "Strange babies," as Chambers calls them, are still being developed in the Eastern Archipelago. The gorilla of Western Africa is, even according to Professor Owen, *very like a man*. The same great comparative anatomist has proved that the skeleton is the same throughout all vertebrate animals; in fact, animated nature is essentially homologous;—and not only is the crustacean skeleton a rudimentary vertebrate skeleton, but the fish is identical with the bird, the gorilla, and the man.

And then for more human antecedents. The ordinary apes of India, singularly cunning, clever, and imitative, *combine* and band themselves together, march armed and orderly like a well-drilled regiment, to the same distant places at regular intervals, and evidently instruct their sons to do the same, and to perform some ceremony at their common meeting place, before they again march off to their distant homes, in the same orderly manner which marked their coming. We have no space for the thousands of

proofs we could give of active, thoughtful, judicious, and, therefore, reasonable conduct on the part of monkeys, who must, consequently, have a brain very like a man's. Many African, and other lowly races, are precisely like monkeys in their faces, and strongly resemble them in their habits. We regret we cannot agree with Mrs. Stowe and believe in a still more rapid development of the African family. "Uncle Tom's," with all due deference to Mrs. Stowe, are not the rule, but the *very*, nay, the most rare exception. In fact, the actual existence of an "Uncle Tom" has yet to be proved. All African negroes, and most ignorant people, are very impressionable to religious descriptions, but the proof of high-souled, consistent and self-denying conduct in a negro is still wholly wanting. Of Toussaint L'Ouverture, perhaps the only apparently noble black we read of, we can hardly judge. Perhaps, if we could, his private or entire character would not have satisfied our notions. But who of us ever saw and talked with a pure negro (not a half Anglo-Saxon with many of our feelings and ideas), and did not, without any doubt, or pride, or vain feeling of superiority, instinctively feel that he was not speaking to one like himself, but to one, in all essential respects, a link between us and the animal world, of undoubtedly lower origin than ourselves, and far inferior to the Anglo-Saxon race in all that constitutes the dignity and greatness of a proper man? We don't despise a horse because he is not as ourselves. We regard sheep and

oxen with all mercy and consideration, until we want to ride one or eat the other ; and so of the negro. No enlightened individual would abstractedly oppress or malign him ; but in the concrete all the Europeans have, without exception, cajoled him when it suited them, and made him work as long as possible, when they required work to be done under a tropical sun or in a swamp which they feared to enter. Englishmen do not now actually buy slaves, but they help to *sell* and deceive negroes in every way. Trade guns at five shillings each, warranted to burst if fired, bad rum, worthless beads, useless gewgaws, have long been nationally imposed on the African black. Who does not know the vermilion-deal stock and the five-foot gas pipe which England's workshops produce to deceive the poor savages ? In fact, their monkeyish stupidity is taken advantage of, and we have made them collect ivory, gold, grain, palm-oil, and other things, which are of great value to us, in return for the rubbish we take them. If we hire a black as a colonial servant we don't treat him like a white servant at home. We thrash him when we think he deserves it. Indian officers "lick" their niggers, and East and West-Indian masters flog, kick, and beat them, whenever they skulk or disobey. We cannot perhaps help ourselves. We are not all Rareys or philosophers, and we have not, as a nation, arrived at the idea that niggers, like Charles Dickens's "butcher's meat must be humoured not drove." We still drive our horses, our asses, and

our niggers whenever we can find them, though we have nationally dropped the dangerous practice of openly buying their bodies, and keeping them as our own, and doing in all respects as we liked with them.

The negro is undoubtedly one of the great connecting links between monkey and the higher races of man. If we may argue from the embryotic brain-formation of a Caucasian, the negro might, in course of generations, under favourable conditions, progress into the Malay, the Malay into the Mongolian, the Mongolian into the Caucasian. But we see not why a Cingalese or Indian ape should not develope into man, anticipating by some superiority of origin, several of these intermediate stages. Temperature of climate and superior acclimatization thereto greatly help the development of Man, just as excess of climate degenerates him.

The African or Eastern Archipelagian entering the Malay latitude, would develope his family gradually into Malays. The Malay would progress to the Mongolian. The Mongolian, that grown-up European baby, comes from hot Asia into colder Europe, and becomes a Pole, a Hungarian, or a Russian hybrid, fast developing into a European-Caucasian. Who would think, that that aristocratic and courtly barbarian, Nicholas of Russia, had Asiatic progenitors? But he and all his conquering Russians had; only a few of his Finnish and Esquimaux subjects were, before the Asiatics, the holders of Russia. The present Russians are undoubtedly half-developed Mongols, whom climate and more fixed and

civilized habits are converting into Europeans. The very Scythians are now organised Don Cossacks, and they no longer live their strange lives in Herodotean waggons, but do strict military duty in squadrons or in pickets of ten, armed with fire-arms as well as spears, and drinking alcohol instead of milk.

The wandering Arabs and the nomadic Turks are marvellously content to doze or gloat away their time in sedentary Stamboul, now that a European climate removes the necessity of continually removing their ancestral herds.

The Frenchmen about Bayonne rejoice in the bloody bull-fight. The cool Norman peasant would pronounce it barbarism to bait or kill the sire of *his* cows. The religious and liberty-loving Dutchman (in Europe) keeps 40,000 slaves at Surinam. The Anglo-Saxon race in New England winks at slavery, the Southern States revel in it, the more northerly British possessions abhor it—the same race in different climates acting differently ! The Irishmen, descended from the poor Celts, hunted by Cromwell, and William and George, have marvellously retrograded : their faces, forms, wild passions, fierce cries, brutal ferocity, or maudlin confidence in priests, agitators, leaders of any absurdity, prove how they have receded to the animal type in body and brain. Thus all is changing. If the conditions be good, man improves, and animals become more like man. If the conditions be bad, man degenerates, and animals cease to progress, if they continue to live.

What man will be we know not, but everything points to a possibility that he will be one day sovereign lord of nature, and, as it were, a God upon earth. What he has been is plain. He has sprung from the beasts of the field, and at present represents the highest type of animal existence.

CHAPTER VII.

The more favoured races of Man.

By a more favoured race, we mean one to which, innately strong, the surrounding climate and conditions are most favourable. The Anglo-Saxon race we hold to have been in these respects especially favoured. And we hold, therefore, that the Anglo-Saxon race will gradually supersede other races *in all temperate climes*, and, if renewed often enough from their proper home, surpass all others in every climate. Before this race the savage is already receding, both in America and at the Cape. In Australia and the West India Isles, as, indeed, elsewhere, it is only a question of time, provided the general conditions of existence remain as at present in temperate climates. In such the higher race must exclude the others wherever they meet; and, as the higher race is perpetually extending itself, in whatsoever regions the climate is favourable to its further development, throughout those will the higher race pursue its progressively extensive march. In lands

only where the climate degenerates them, will Anglo-Saxons cease to be supreme. In fact, they will do wrong to attempt to migrate, as for settled habitation, to those climates which may be regarded as the laboratories in which fresh elements of the human race are even now being compounded.

The tropical and juxta-tropical regions of earth may now be considered as the home of the developing and inferior races of man—of man, that is slowly passing in countless generations, through the more humble of those stages of development which link ape to negro, negro to Malay, Malay to Mongol, and Mongol to Caucasian. In short, an Anglo-Saxon ought no more to try to live in the proper home of the gorilla, the negro, the Malay, or the Mongol than ought a man, who has painfully won his way in life to honour and wealth, to throw away his hard-earned prizes and again personally, and for manual labour's sake, to mingle and associate with, and live amongst the mass of his own more lowly fellows. As soon should Stephenson or Morrison, in the plenitude of their fortune, retire to a room in Mile-End, or a collier's cottage near Newcastle, and recommence work at a guinea per week.

It cannot, we think, be uninteresting to here give some account of what is on record about the strong and favoured race which now chiefly dominates the world.

The Celtic element forms but a small ingredient in the English race. Except a few slaves and women, the

Romans, Saxons, Danes and Normans extruded the Celts from all England, save from some northern and south-western districts. Wales, Brittany, Ireland and Scotland, received the retiring Celts, and the east and south and centre of England became the home of the Englishman. The Norman was but a Northman akin to a Dane, who had spent some years in Normandy. The English race, tempered slightly by Celt and Norman, was thus chiefly composed of Anglo-Saxons, or northmen, who temporarily halting about Denmark, came from Anglia and Saxony to England. In fact, the English are of North European or German stock; and we cannot do better than refer to Tacitus, a most shrewd and enlightened Roman historian, who collected much interesting information about the Germans. Tacitus was son-in-law to Agricola, who was military governor of Britain about A.D. 84.

We shall, at least, see what the Germans were like personally, socially, and politically, nearly 1,800 years ago.

In the first place, Tacitus believed the Germans were natives of the soil. And Tacitus also says, "In their ancient songs, which are the only kind of records or annals known amongst them, the Germans celebrate Tuisco as a deity sprung from the earth, and his son Mannus, the original founder of the German race."

Thus Tuisco was something or somebody *sprung from the earth*, and his son was Mannus, or Man. Not a bad approximation this to the development theory.

+ The origin of Tuesday & the Deuce
Tuisco's day & the Deuce

Tacitus gives a curious proof of the alleged *peculiarity* of the German race. He says, "I agree with the opinions of those who hold that the people of Germany are mingled with no other races by intermarriage, but distinctly stand forth as a nation resembling only themselves. Whence also their bodily size and appearance, although manifested in (or ranging over) so great a multitude of individuals, is identically similar; all have fierce and bright blue eyes, ruddy locks, and great bodies." And Tacitus was quite right to argue thus. As long as the Germans lived northerly and unmixed by intermarriage, Like would produce substantially, and nationally, *Like*. The same German type is even now well marked, and many a blue-eyed ruddy Briton may here see his remote parentage.

The religious conceptions of the Germans were naturally of a high order. They did not dream of either 30,000 deities, like a religious Roman, or adopt the many grovelling superstitions which have, in other races, helped to diminish much of the intellect that endeavoured to develope itself. "But they believed that they could neither restrain [the gods within the walls of temples, nor assimilate them to the likeness of any human face. They thought it was incompatible with the majesty of deity to attempt to do either." The words almost ring the sense of the mono-theistic Hebrew Scripture, and the bare existence of so noble a conception at such a time among them augurs well for the future of the race. Equally enlightened, too, does

Tacitus represent their political ideas. They had king, lords, commons, and many other things, just as Englishmen have now, only they chose their kings and generals much better than we do now. "They choose kings out of the nobility, generals out of the bravest, (or, 'in consideration of ability' as 'ex virtute' may be better rendered). But their kings have not unlimited and absolute power; and the generals maintain their superiority rather by giving continual proofs of their merit than by barely exercising command." Is it any wonder that such a race has won its way to supremacy? If it only occasionally exhibited such qualities (as we do now, for instance, when routine breaks down), what other nation could long withstand it?

But especially high did our German ancestors rank in the estimation of Tacitus for their social and domestic virtues.

These rough husbands loved their blue-eyed wives and flaxen-haired children, nay, all their kindred, so well, that "their families and relations were the chief incitements of their courage."

And as to their chastity, matrimonial trustworthiness, candour, hospitality, and morals generally, let the present generation read this.

"Although among the Germans marriages involve much that is stern and severe," (this, perhaps, hints at mothers-in-law,) "yet none of their social or moral customs are more worthy of praise. For Germans, almost alone of barbarians, are content with one wife."

“Their men and women are equally ignorant of all methods of clandestine correspondence ; and, considering the great numbers of the race, adulteries are extremely rare (‘paucissima’). And among them morality and good conduct prevail more than good laws do among other people.”

“Their mode of living combines frank politeness with ready hospitality. Their drink is a liquor made out of barley or corn, fermented into a certain resemblance to wine.”

“They display no pride in their funerals, but erect a simple grave-mound of turf. It is considered right for women to *mourn*, for men to *remember*, those who have departed from among them.”

Could the whole category of wheresoever existent simple-minded English habits and virtues be more beautifully, more truthfully, set forth ?

And now one more fact as to their early religion.

In the 45th chapter of his *Germania*, Tacitus says, “Then the Reudigni and Aviones and Angli (English,) are protected by their rivers or mountains. And the only remarkable thing connected with each of them is, that they worship, in common, Herth, that is, the earth (as) their mother !”

It is certainly “notabile,” as Tacitus has it ; and it serves to supply us with an argument for our approximative theory of earth development. It was the more “notable” as their close neighbours, the Fenni, or Finns, were a much less godly, virtuous, or active-minded people. In fact, these neighbouring Finns

serve for an example against the theologically alleged argument drawn from "universal consent" as to the existence of deity. For these apathetic "Finns regarded neither gods, nor men, and reached such a pitch of apathy, ordinarily most difficult for men to arrive at, that they did not even feel the necessity of a vow, or a prayer, or a wish."

"Other matters," says Tacitus, "connected with these Germanic regions are now matters of story: especially have I heard that the Hellusii and Oxiones have the faces and aspects of men, combined with the bodies and limbs of wild beasts; a statement which, as I am unable to verify, I must leave as unsettled as I find."

So that the very last information we derive from our historian is the (of course, physically unprovable,) record of animals developing into men.

We could add very much about these old German Angles, but we have said enough to prove their innate power of race, their marked distinctiveness from other races, and their early traditions, all pointing to an earth origin. Their actual beast origin is far from clear; their rites pointed to the wild boar, but it seems generally admitted that they marched under the boar's head, or carried a boar's shape in their religious processions, rather as an emblem of combined strength and fertility than from any other cause.

Whether, then, the boar, or the lion, or the horse, or any other animal was their original parent stock cannot,

perhaps, in the present state of knowledge, be ascertained. But we see in the gorilla, or lion ape, that strong and fierce tribes can spring from the lion. We infer from the Greek statues and legends that other tribes were, in early ages, believed to spring from horses, and from goats. We see many strong resemblances in the Hebrew race to sheep. Perhaps, therefore, from a sea or land-lion tribe may have developed the intermediate races which gradually proceeded into those men known to Tacitus as the fierce-eyed Germans. The early hatred of polygamy, so rare among the uneducated, may be also thus accounted for on the score of descent from the faithfully pairing lion. That swarms of such, now tropical, animals formerly existed in these regions we know from the well filled caves and bone districts in England alone. We have, then, close at hand a plentiful supply of the native raw material. A period of developing climate, followed by long periods of temperate climate and favourable circumstances—and a short geological period, would be amply sufficient for both processes,—such are all the requisite conditions to furnish us with an approximative notion as to the origin of the “British Lion.” Before quite dismissing Tacitus, we wish to quote one of Dr. William Smith’s notes on the passage about “Herth-worship.” It will shew the universality of the worship of the earth as the common mother of all men. In all parts of the earth nations seem to agree in this—the earth is the mother of us all. Concerning this early form of

German worship, Dr. Smith says :—"Nearly all the circumstances mentioned here concerning the worship of Herthus agree with those practised at the worship of the deity of the earth (called Ceres, Rhea, Ops, Demeter, Cybele, or Isis) in Thrace or Phrygia by the Cabiri, Corybantes, and Idæan Dactyls." Hence, and from other reasons, some have argued an identical origin for the chief races of Western Asia and Europe. But the difficulties as to race, form, language, and customs are so great that no one can believe that a dark-haired, swarthy-skinned, slim and elegantly-speeched Phrygian sprang from the same original as the lusty, blue-eyed, harsh-tongued German giant. That they all worshipped a common parent is easily intelligible, for all men nearest to their real origin would have a similar tradition. They could have no other, and in very early times there were no theologies. Myths only came in a few thousand years ago at the earliest. Even the documentary existence of our Hebrew Scriptures cannot be even inferentially proved earlier than the days of Simon, the Maccabee, little more than one hundred years before our era. The oldest existent mss. of the book is only 400 A.D. And the writings of the Chinese and Hindoos and Egyptians are certainly not more than a few thousand (4,000) years old at the very utmost. And what are thrice 4,000 years in the age of the world's development? "The Weald" (of Kent) required at least 300,000,000 years to assume its present aspect. Here alone is ample time for the working out of our wildest hypothesis.

Before closing this lengthy chapter, or, if you please, by way of postscript to it, we desire to add an incidental proof of the early Germans having, in their ancestors, passed through the ape-type. We know from the often quoted account of the pilgrimages of Indian apes, that apes do make what we cannot but consider the originals of religious processions and pilgrimages. Now Tacitus describes the ancient Germans doing (with one exception, and that an addition,) just as a modern writer has described the Indian apes in their processions.

“The Senones declare that they are the oldest and noblest of the Suevi. Belief in this antiquity is strengthened by their peculiar rite. At a stated time all the tribes of the same blood proceed together into a wood consecrated by the auguries of their fathers and by ancient awe, and having slain a man for the general good, (or publicly,) the barbarians begin to celebrate their dreadful rites. But another reverence is also paid to the grove. No one enters it unless fettered by a chain, as a mark of inferiority, and denoting the august power of the wood. If, perchance, he stumble and fall, he may not be helped up or simply rise; he must roll himself along the ground out of the grove. And hitherward, viz., to the grove, does all their superstition have sacred regard, just as if from this grove were the beginnings of their race, as though therein resided the deity which controlled them all, and all things else were subject and obedient.”

We cannot but see in this beautifully descriptive passage a clear evidence of a very early conviction, on the part of these Germans, that their ancestors had struggled forth, humbly and lowly, from the earth, and in some mysterious way, through the supporting agency of a wood. What though they themselves probably failed to realize the exact reason of their thus perpetuating the memory of their ancestors having once crawled on all fours as beasts of the forests, or journeying together as Indian apes on a mysterious or forgotten pilgrimage, or of their still more remote progenitors having sprung from the earth itself. Do we, or our children, clearly comprehend our own solemn customs? Do we know that Syrians wept for Adonis before Christians fasted in Lent? Do we know that the Roman Saturnalia is our Christmas? Do we know such simple things as the origin of buns, puddings, or cake ornaments? But do we ever miss a Christmas-day, or any such set feast, or fast, or festival? Let us not then object to the Germans being dimly cognisant of the reason why they marched into and worshipped a grove, or crawled out of it and glorified it together with the earth. We humbly submit that the only meaning of the passage (dimly revealed, it is true, but yet ever shadowed forth in all the early histories we read, whether of Tacitus or other writers,) we submit that the only meaning which we can fairly ascribe to the record we have quoted, is that the early Germans themselves had a vague but constant tradition of their own gradual development from

particles of earth into animals and man. They renewed the ancestral pilgrimage, they worshipped Herthus, the forest, some mysterious and intermediate being called Tuisco, and, fourthly, Mannus. All this accords with the old Egyptian notion that the earth's animals contained the ancient gods, that is, the most ancient heroes or god-men who were regarded as Divine, and whose sons only were regarded as veritable men. In fact, the same idea is so prevalent in all really ancient traditions, that we should be inclined to reject from the ranks of really ancient records any tradition, whether written or orally communicated, which did not include reasonable allusions to Herth-worship, or grove-worship, or god-man worship, or to semi-human animals, and divine or semi-divine men.

We need not further track up the English race—strongly tintured by Franco-Normans, gradually absorbing the independent and best brain of other countries, ever helped up and refreshed by constant streams of raw material from Ireland and Wales, all of which the English materially helped to improve by sending settlers to in return, again repaying themselves quickly by improved accessions. All this, combined with great natural advantages, a magnificent supply of coal and iron, a central mundane position, a soil which calls forth and repays intelligent industry, a fringe of ports which trade easily with all the world; with the old sea-king talent for ships, and war, the Anglo-Saxon courage and temper of steady perseverance,

the acuteness of the Celt and the Frank, and the accumulated brain-stores of the previous and contemporary world of men to fall back upon, England slowly gathered her power together, and after a few internal commotions, as a giant shakes himself to feel his strength, England soon cast off many of her trammels of soul and body and burst forth under the Tudors into that splendour, which renewing its brilliance under Cromwell and Orange and Anne, is now coruscating more brightly than ever under the renewed Germano-Anglian Victoria.

A question or two to the Bonzes of society, and we cease for a season. Do our views of animal development involve that impiety and humiliation which are ever ascribed to novel scientific statements? Can one who holds such views as we have promulgated, love men or animals the less tenderly because he is convinced of the innate relationship of all? Must not brothers of one family have closer sympathies, truer, holier bonds of common affection? And then as to the Author of Nature, the propounder of these ineffably grand laws of development. Which of the following men must think the more reverently of Him? — The man who believes in the Providence which could thus plan a world and forecast the type of man when the world was not, and the earth was without shape—in the providence which re-arranged the laws under which a cell should develop into “fearfully and wonderfully-made” man—in the providence which evoked all this grand sequence by the issu-

ing of one stupendous fiat, “develope!” earth and water from air—man from water and earth,—brain, thought, happiness from as nothing! Shall not such a believer reverence the Great Architect more than can the man who peddles in old fables, and trammels the God of Heaven and Earth to the pages of a poetico-historical Jewish manuscript?

We shall soon meet our friends and our Bonzes again, amplifying our facts as soon as our health shall permit and verifying as much of our theory as we can.

We now leave for a brief space our merely approximative views of the development theory and approach topics which we can treat on more certain and established principles. We invite our readers' attention to some concluding considerations, concerning the effects of climate and other conditions, and concerning the science of sciences—Biology. By Biology, we mean discussion or consideration of anything which improves our knowledge of the laws of society, of men's lives, of men's bodies, of men's brains, and of men's happiness.

CHAPTER VIII.

A Chapter on the Effects of Climate and other conditions.

LIMITED views of any subject purely produce confusion in writers and readers alike. For instance, what confusion of ideas has long been prevalent about phrenology! One man has attempted to write about it, and another has objected to it, when both had only *craniology* in view. So another has attributed to physiognomy all that may be claimed from the triply-sure science of phrenology, which is, in reality, neither craniology alone nor physiognomy alone, but includes each of these two constituents, and combines with them a third also, viz., physiology. Yet how few of even the devoted adherents of phrenology have ever generalised the truthful and natural harmony of craniological, physiognomical, and physiological conditions, as all equally necessary to enable us to form a correct idea of any given individual! and, therefore, “phrenologists” are very rare. Many self-styled professors are, no doubt, charlatans; some few are sincere but short-sighted men. Only an educated physician skilled in skull, face, and

constitutional powers and indications can by possibility be a true phrenologist. And as skilled physicians are, in spite of medical colleges, extremely rare, and rarely have even their attention directed to phrenology, phrenologists scarcely exist. Besides, now that labour is in all ways so sub-divided that even physicians must devote themselves to one especial branch, as Locock to obstetrics, Alexander to the eye, Yearsley to the throat, Wilson to the skin, others to particular diseases, others to pure surgery, a comprehensive knowledge of craniology, physiognomy, and physiology seems almost hopeless. Those that have the rudiments of the necessary skill, at present fail to fairly develope it. The time will come, we trust, when the noble and comprehensive science of phrenology shall receive a due meed of reverential, laborious, and comprehensive devotion. But just as from the above-mentioned causes our medically educated men think little and know less about phrenology, so also from similar causes do our scientifically educated men fail to realise the truths of development. As a man accustomed to examine skulls only leaps to conclusions from osseous formations alone, so a naturalist, like Lamarck, regarding surrounding conditions only, or a savant, like the author of the *Vestiges*, regarding link-development alone, seems to entertain the idea of some one species at a given point, and independently of other conditions developing into some other species, just as Babbage's calculating machine jumps on 10,000 at a certain step of its progress. But

both Lamarck and the Vestiges have failed to give due weight to the three disposing causes of animal development—innate potentiality (or power of race, derived from the originally constituting atoms of each), conditions, and climate.

These three causes act and re-act on each other. Suppose, for instance, to recur a moment to phrenology, a well-developed cranium to be accompanied by a bad physiognomy and by a weak constitution, the brain within the cranium will be evidenced by the bad physiognomy to be in point of fact inferior to the brain of a well-shaped cranium, accompanied by a well-shaped physiognomy ; and in either case both the head and face-manifestations of character will be largely modified by the weak constitution. A grandly-shaped cranium may be rendered all but powerless by an otherwise puny physiology, and a much smaller brain development may be rendered very acute and powerful by a vigorous constitution. Brain is but the muscle of thought and sensation secreted, like other muscles, from the blood, and if the blood be weak or impure the brain is at once similarly affected. Thus a parent with well-developed head may overwork his physical powers and communicate to his offspring the germ of a good cranium, accompanied by a weak constitution. Many hard-working able men thus justify Solomon's adage as to the uncertainty attending a wise man's child : and more lowly organised parents who have not equally exhausted their physical, and therefore also their mental

powers will, as a rule, have better developed children than any that can spring from a highly-wrought and over-worked sire. Therefore, to take a correct phrenological view of an individual we must fairly weigh, in all their respective relations, the joint and several influences of his craniology, physiognomy, and physiology ; similarly, to obtain a right idea of development we must consider the innate force, the conditions and the climate which have tended to produce and modify any race or individual.

As some atoms possess more active elective affinity than others, as some substances are more or less elective, volatile, impressionable, mutable, than others, so also are the plants or beings composed of accumulations of such atoms and substances, more volatile, impressionable and changeable than others. These primary qualities we denote by the somewhat inadequate phrases, innate force or power of race. But this power of race, or original constitution, is largely acted upon and modified by conditions. And by conditions we mean to express all the environning circumstances, except climate, which we regard as a sufficiently important element in development to be entitled to rank as a separate and very potent condition.

Bearing in mind these three efficient causes of development, we see no difficulty in the immense increase of gigantic ferns at one time, of huge animals at nearly the same epoch, and in the present changed aspect of our own Flora and Fauna. The innate force of the modern fern is probably much the same, but the

other two conditions are largely altered. There is no super-abundant supply of the constituents of either lepidodendra, or saurians, now in existence. The coal-forests used up the superabundance of vegetable constituents and the only animals able to live under the conditions of vast forest and swamp-life, retired from the scene, by modification and gradual self-accommodation to other scenes, when the coal forest epoch had absorbed its producing causes and the carboniferous era fairly gave place to a more moderate and temperate climatal condition.

Among lower organisations heat plays a most important part in development. In our own hot-houses we alter, improve upon, and, in many cases, subvert the order and seasons of nature. We can make our coldly temperate climate, by the aid of heat gradually decreased, satisfy the thus gradually acclimatized plants of the tropics. And practically we can gradually inure many tropical inhabitants to our own, or any other country. And we can also support, in all its tropical luxuriance, the vegetation of the hottest regions. We thus familiarly shew the power of climate; but we cannot always succeed so well with tropical animals. Monkeys are very difficult to keep in England through many winters. We find no apes near the frozen poles. And we find very little vegetation either. But where heat is great and constant, we find a superabundance of both plant and animal life. And, therefore, near the tropics we see development most common, and transition

animals least rare. There is no lack of every sort of ape, dog-monkey, lion-ape, ourang-outang, white ape, and tribes of others, struggling from a lower into the ranks of a higher existence. Climate is evidently the great material adjunct to the original motive force or power of race-development. But conditions of many kinds quicken or retard this development. Neighbouring tribes of fiercer men or animals ; the fact of wandering into less favourable tracts ; the event of meeting with famine, drought, or plague ; the uncertainty of an increasing race being sufficiently stationary or hemmed in by natural barriers to cause the creative and inventive powers of brain to be even moderately elicited,—all these conditions or their contraries most seriously act or re-act on the developing race. The Red Indians in America have no chance of developing now. Europeans have interfered with them. Fire-water, and new diseases are doing their work. The hunting ground of the savage is yearly decreasing. Soon he must go, for the higher race can no more live in the same place with the lower than can the fine European gentleman live in a stable or in an Irish family hovel. Efforts to coalesce would certainly degrade the higher race, and even, if natural repugnance were overcome, which, as a rule, is not overcome, the lower race would be prematurely and unduly stimulated rather than healthily and properly developed. As the Anglo-Saxons and other Europeans are rapidly absorbing the parts of America in which they can exist, so are they stealing over the

accessible portions of Asia and Africa. Fit islands are being still more rapidly absorbed. And the Caffre, the Australian, and the West-Indian native will soon be things of the past. Already are the Caribs disappearing. Cooper has sung, rather than told, the dirge of his country's aborigines. But all these lowly races were developing into near approaches to our own type. We changed some of their chief conditions, and already they begin to cease to exist. The wild bull and the wolf no longer exist in England. Red deer are scarce, even in Scotland, but William the Conqueror killed men who hurt one of his loved red deer in the south of England. Enclosures of land and cultivation of forests have changed the conditions necessary to red-deer existence, and, though "preserved" by highly penal laws, the red-deer is ceasing from among us. In these instances no startling change can have occurred, either in power of race or climate. Other conditions have caused their disappearance.

With man, however, climate is of even higher importance than other conditions. No race, far from the north temperate zone, has ever arrived at historic eminence. In the south temperate zone the smaller amount of, at present, existing land, may in time produce rivals to the children of the north, but as recent enterprise has only lately opened up Australia and New Zealand, we must look to the north alone for historic proof of what we are about to assert. Man, and especially Indo-European man, excels in the north temperate zone.

Tropical heat relaxes, degenerates and demoralizes him. The Russian covets Constantinople. Foolish Russ ! The Roman and the Saracen have tried it before, and, though by no means intensely relaxing, it has enervated and ruined the ancient vigour of both. The soft and fertile climate of Ionia has rarely yielded other sons than slaves. For a brief space of years the happy infusion of sterner races has caused Greece and Rome to successively dominate far and wide, but climate told upon them ; and the patriotic Athenian, the warrior Spartan, the hardy Macedonian, and the iron-limbed Roman, each in his turn, succumbed to the softer clime to which their restless fate had brought them from the northern or ruder homes in which their frames grew strong and equal to their ambition.

The Swedes and Goths from the Baltic melted away in southern Spain and Africa. The early Christian churches grew fast in Asia Minor and northern Africa, and then disappeared like moisture absorbed by sand. Europeans in tropical America are degenerating before our eyes. They are slave holders, and lean to despotism. The Spanish race in Mexico and central America has become a bye-word and a disgrace among nations. The degraded personal vices of Brazilian and other South American planters are too repulsive to be more than alluded to. It is trite and true, that neither a man's nor a nation's constitution can long consist where the thermometer stands permanently at 80° in the shade. The French can do little good in Algeria. The Phœnico-

Carthaginians failed before a more northern race ; and that more northern race failed, as soon as her more northern neighbours learned their strength. The Swedes have shewn what a handful of northern warriors can do. The Russians, if educated and free, would soon be a most formidable foe. Germany labours under evil conditions, such as long continued king-craft, religious hatreds, bad laws, divided interests, and unhealthy customs. But northern Germany has the right stuff in her, and like northern America, might run England hard in a struggle, whose prize alone is worth contending for, intellectual and happiness-creating superiority. France is something like the United States, in that she unites a cool north to an ardent south. Her race, except in a few large towns, is decidedly inferior, and she has regularly allowed her priests to extrude her best brain. Long and grievous tyranny has produced wide-spread ignorance, and re-actionary periods of such violent despair and conflict, that she suffers as much from the unreasoning efforts of her own children to improve their position, as she does from the misery they have for ages endured. There is little calm reason or sober enjoyment in France or in Frenchmen. Some of them excel in exact science and practical skill ; some few, as in all large nations, are noble specimens of humanity ; some of them superabound in fanatic zeal, and all the hideous madness of priest-craft. Many of them "halt between two opinions," and fritter away their lives in seeking the excitement of their ruling personal selfish passions, love, and

glory. Allowed to predominate, the one passion becomes lust, the other, vain glory or bloodthirstiness—in either case, one of the greatest curses which can wither a nation. Italy is, as it were, a volcanic nation. Like the mountains of their country Italians ever and anon flash forth into vivid and startling explosion, ebullition, coruscation, and then follows a dreary period of rumbling silence and devastating ashes. The Medici, Rienzi, Massaniello, Garibaldi, are noble names. But the eruption passes, and Italy lapses into the dull death of Herculaneum and Pompeii. We would, but cannot, hope for Italy.

Of Spain, as of ancient Italy, the glory is over ; whether it will rise again in some other form, as Italy perfected architecture, painting and music when the glory of arms was denied her, or whether the innate power of the race may yet partially recover itself, it would be useless to prophesy : at present we only know that the mingled races, which conduced to their ancient grandeur, have now lost that vigour and earnestness which alone make men or nations great. The climate, aided by destructive laws, bad rulers, cruel religion, has done its work. The people left to themselves, and provided with good, secular, and untrammelled scientific education, might yet do well ; for, like the French, they have some noble, aspiring, chivalrous tracts yet left in their characters. But like the French, the conditions of the masses of peasantry are terribly bad. Vilely ignorant, and, therefore, ignorantly vile, the peasant class of each country rather vegetates than lives.

And now of England, what shall we say? The happy conjunction of temperate clime, isolated but central position, well mixed inhabitants of all the best races that the north temperate zone has held, England could not but excel. Her sons are sprung from the hardy, the strong, the earnest and the free. Except in the protestant cantons of brave little Switzerland she has no even comparative rival on earth. With her own sons in America and elsewhere she is identical. But in all the rest of the world, with whom shall we compare her? Regard her science, her inventions, her freedom, her fleets, her riches, her sons and daughters! Compare her in all these respects with any nation that is, or has been, and though we know that she is yet only slowly progressing to what she will be, though we know that she has many internal defects, many national blots, and much uneducated and uncivilised raw material, we cannot but be struck by her immense superiority in every solid, useful, and scientifically-obtained blessing which the earth can afford.

Well may Englishmen love their country. Its soil, its climate, its surrounding conditions, have powerfully combined with the virtues of their stock to make them what they are. Send the same men who flourish here to southern India, or China, or the West Indies, or the Southern States—what sort of men do they become when they have exhausted the vigour of twenty years in a strange land, subsisting on the food of a strange country, and fighting the fight of life amidst strange conditions?

Even though they play assiduously at English life, and import English beef and Bass's ale, they no longer return actual Englishmen, but more allied to the soil on which they have been vegetating. An Englishman's and Englishwoman's children born and bred in the West Indies, or South America, are rarely in form or face like English children born and bred at home. The climate and other conditions immediately affect and modify the innate power of race. But even so modified (and English-Americans can grow wondrously like lean Red Indians in a very few generations,) even so modified the power of race elevates Anglo-Saxons immensely over the inferior races amongst whom they go to dwell. But we have said enough when we mention the early fleeting youth of the Anglo-American ladies, and the lean calves and high-pitched whining voices of the Anglo-American Southerners, to shew that climate can greatly change even the longest-lived and stoutest-limbed and loudest-lunged race in the world. We may, therefore, conclude that innate force, conditions generally, and especially that of climate, are the three prime efficient causes of animal development. In one brief phrase which we trust will now be fairly understood, and with which we conclude this daring chapter of attempted approximations, "*conditiones regunt.*" Conditions rule. First, the conditions of original constitution. Secondly, the conditions of climate. Thirdly, the conditions of food, laws, neighbours, and customs.

Conditions rule development. And as conditions are almost infinite, development is little less than infinite also.

It is reserved for the observing intellect of rising and future generations to collect FACTS and record EXPERIMENTS ; and that they will thus render plain the mysteries of Being we have a cheering testimony in the successful application of Bacon's Inductive Philosophy to the processes of scientific discovery.

In the short 300 years which have elapsed since Bacon's mighty genius pointed out HOW to break down the barriers of ignorance, grand laws and truths undreamed of even by Bacon, have been daily discovered and unfolded. We, too, now aspire to hold out to mankind a novum organum, a new instrument of knowledge in the hundred worlds of being, by the fair and unshrinking use of which the mysteries of life itself shall be before long clearly unfolded to earnest and practical truth-seekers.

CHAPTER IX.

THE preceding chapters were written at intervals during the last four years. Since their compilation, a great work on a closely kindred theme has been published. The author of this work, Mr. Darwin, has evidently saved the writer of these "Approximations" much anxious labour; for, besides demonstrating that geology certainly does not disprove a development theory, but even furnishes most lucid reasons for maintaining such a theory, he has proved, in numerous instances, the fact that varieties of species so great as to rank as species themselves are actually produced in plants and animals by modification of external circumstances and physical conditions. Mr. Darwin has also proved that these varieties become hereditary. Further than this, Mr. Darwin shews, by a mass of cogent arguments, that some species usurp the place of others, that some succumb and *disappear* before the onward march of stronger competitors. These stronger competitors he calls naturally selected and favoured races; and from

the modification, which, being developed in the member or members of any species, has caused such favoured and selected plants or animals to surpass or extrude or out-live others, he argues that successive varieties of species are also produced.

In enumerating the probable causes of such modification and variation, Mr. Darwin appears, in spite of his own most numerous proofs of the facts, to undervalue the effects of climate and general surrounding conditions. To the writer of these approximations it appears, beyond all doubt, that all causes whatsoever, whether innate capacity for development, climate, or surrounding conditions, such as food, soil, the neighbourhood of other plants, mammals, birds, insects, ought all to be taken fairly into consideration. Mr. Darwin also omits a very important fact, dependent mainly upon climate or temporary temperature. It is, beyond doubt, that the climatal conditions of the earth's surface have varied from glacial to tropical. These words are used in their ordinary acceptation of very cold and very hot—and it is also, beyond doubt, that periods of subsidence, upheaval, and oscillation must also have had due effect upon the inhabitants of the earth or water. It may therefore be fairly assumed that, as winter shuts up the earth and spring or summer opens her womb, so, in long continuance of glacial or tropical temperature, the development, or progression, or generation of the earth's inhabitants has been retarded or accelerated. In a word, there have been periods of development,

periods of stagnation, and, in some instances, periods of retrogression also. The latter, however, have been small and local compared with the more general and wider scope of the two former. But the fact of periodic development has never yet received due attention.

Nature, like earth, oscillates. Her efforts at times upheave new developments, many of which again subside, and like the extinct (vulgo, antediluvian) Fauna and Flora for the most part disappear, save in, to us, fortuitously fossilized, records. We say "fortuitously" though we know there is no chance or accident in nature, and yet some things, such as a period of subsidence being favourable to the preservation of fossil remains, and a period of upheaval being unfavourable to regular stratified depositions, are to us, as it were, accidental. We use the term, then, much in the same sense as coroners' juries do when they return a verdict of accidental death, or as the generality of men do when they say they have met with an accident. We may know slipping on a stone or piece of orange peel is no accident, but carelessness on some one's part, and yet we call each event an accident. So, then, we speak of accidents in development, when we mean things have occurred which we do not for time's sake, or through ignorance, try to track back to volcanic, or aqueous, or any other impulse. In this sense we are about to use the word accidental when we say that to accidental and periodic development are to be attributed those perplexing and doubt-creating phenomena which so puzzle

Mr. Darwin in the putting forth of his noble conceptions of variations of species by natural selection.

Darwin's great argument seems to be, all plants and animals naturally seek to multiply, and in such efforts some vary, the strongest alone surviving in the fierce struggle for existence, while the weaker die and become extinct. Expressed in plain language, what else is this than a strong confirmation of all things being by nature so constituted as to contain within them the germs of development, which germs are only brought to perfection by favourable climate and conditions? Divest Mr. Darwin's argument of these adjuncts, and we have no adequate causes assigned for the multiplication and variation alleged. Thinking chiefly of one *modus operandi* only, and teaching that nature selects and the selected vary and develop into higher forms, he seems to us to overlook the entire unity of nature. He seems scarcely to regard plants and animals as what alone they are "of the earth earthy," and, therefore, he undervalues the vast potency of climate and surrounding conditions. In spite of a struggling conviction of the contrary, he is "hankering" after a "creation" of at least one pair of animals, and one specimen of a perfect plant. But if a "creation" be necessary, why may not "creation" be called upon to do the rest of the work ascribed to more gradual causes? And if gradual causes be proved to be unquestionable in all save "creation," why cannot Mr. Darwin extend his own arguments a little farther, and see in the gradual disinte-

gration of earth's particles the efficient cause of that gradual formation which has hitherto been erroneously regarded as instantaneous creation? In nature all is gradual, and creation cannot but be gradual formation.

While, then, we thank him warmly and gratefully, for the laborious, candid, and scientific work which we have read with immense satisfaction, as a grand move in the right direction, we humbly venture to suggest to him that in collecting individual proofs he may not be allowing his mind scope enough in generalisation. Else it appears to us, he must see that at least three grand causes underlie what he calls variation or modification, and what we plainly call development. The causes are innate capacity, climate, and surrounding conditions. The first is the result of the accumulated vitality of the original constituents of the plant or animal; the second, as in glacial or tropical seasons, is at once intelligible; by the third, we mean those circumstances which as food, other animals, or plants, may act or re-act on the original organisms to their development, to their continuing stationary, to their repression or extinction. Darwin shows most conspicuously the effect upon clover of bees'-nests being near the flowers, mice being near the bees'-nests, and cats being encouraged or destroyed in a village. Destroy the cats and you prevent the possibility of the clover reproducing itself. Vegetable marrows and cucumbers would fare no better, if deprived of bees' visits and neglected by man. Deprive the same plants of water or heat, and they would die

altogether. This is what we mean by surrounding conditions ; and as water and cats may fail or be absent anywhere, plants depending on either could never devlope or even live without a due supply of the necessary conditions. But supply the requisite conditions, or let nature supply them as she has done, and, as we most thoroughly believe, is now doing, the fish will become mammal and terrestrial ; the hedge-geranium will become a pelargonium as large as a crown, and a thousand times as beautiful as before ; the crab and slow will become apples and plums, the aigilops will become wheat, and the simiadæ, men. Time is nothing to nature. She has eternity to work in. We only disbelieve her processes because they seem so slow, and because no man has lived long enough to see members of one race devlope into another. The stone book of geology is, however, sufficiently open for us to read of a succession of plant and animated forms, extending over a vast series of ages—ages computable only by milliards of our petty years, and as we see periods when no plant or animal lived, then some plants and animals, then gradually higher and more complete organisms, so we feel unable to doubt but that in the course of, to us innumerable, centuries, nature has developed from the wondrous laboratory of her all-producing womb, the successive orders of plants, animals, and man—man only the highest known animal, and destined, in his turn, to give place to some even nobler development of sensitive and intellectual existence.

Concluding summary. To briefly sum up the gist of our approximative arguments, and to again shew that we have at least authority for much that we have ventured to allege, we will repeat, and in repeating the names of these authorities, briefly re-assign to each the place he appears to us to hold in the world, (or rather, as such authorities are few, in the rank) of scientific discoverers.

Lamarck was undoubtedly right in ascribing great consequences to conditions. The Vestiges-author was unquestionably right when he expounded the law of natural onward development, a law evidenced in the lifeless and only onward-proceeding calculating machine. Mr. Darwin is incontrovertibly right in very much that he has said about the natural selection and victory, in the struggle for life, of certain favoured races. But to understand nature and her children thoroughly, we must combine all these three grand discoveries and add to them that of the atomic theory, and all the truths of geology, geography, hydrology, biology. The time of any one individual is so absorbed by the amount of reading and thought necessary to generalise upon all these facts, studies, discoveries, and considerations, that it is physically impossible for any one in a few years to do complete justice to the grand and comprehensive theme.

The writer of these necessarily imperfect and weakly jointed chapters has been, in addition to much previous reading, studying since the year 1848 without any other

cessation than that which ordinary events and requirements of life render generally necessary. He feels as clearly convinced of the great truths he labours to make clear, as he feels convinced that the sun shines in the heavens. As, however, periods of darkness and obscurity not unfrequently overshadow that brightest luminary, so, too, does he feel his power of lucid exposition frequently slipping from his wearied mind ; and too often, alas, is he conscious that the task he has undertaken is too great for him to hope to thoroughly succeed in.

The full idea, however, of man being developed, by a countless succession of changed conditions, from the original cell which heat and moisture called into existence when elective atoms were disintegrated from the granite breast of our universal mother, this full and complete idea has assumed the shape of the strongest possible certainty and conviction. As the astronomer is convinced that there should be, or should have been, a comet or a planet, in a certain place and at a certain time, though his conviction be unsupported by physical proof—a proof only to be supplied as the cycle of years rolls on—so does the writer of these approximations feel more convinced every day, as he sees learned research unceasingly, and with greater fulness, illustrating the position he assumed years ago, and proving the facts he rather grasped at as necessary, than could have verified if required ; and as he reads in scientific works, only now being published, the absolute proof of various

parts of his theory, such as early cell-life, and its reproductive faculty, and many other apparent trifles in so vast an inductive chain; he grows hourly more and more convinced that the entire truth of his triple development theory will, in time, be established. The article in the "Westminster Review" (for October, 1859) on the Atlantic cable proves much of his reasoning. Diatoms, foraminiferous, and globigerine skeletons form, with sponge-spicules, the great mass of mud which forms the floor of the Atlantic. But why do we find no remains of nobler races?—why do we not find "the bones and teeth and scales of fishes; the shells, star-fishes, corals, and other comparatively indestructible materials belonging to marine animals? Where are the drifted pebbles and sand that might have been anticipated, and what has become of all the hard materials that must have been accumulated in the course of time?" Another of our canons supplies the answer—"Montium ut marium altitudo habitantia regit." "For though the ocean abounds with life yet it is certain that the conditions of deep water are altogether unfavourable to the existence of fishes," and "there is no reason to suppose that below 500 fathoms any large animals are constantly present." Let large animals die, then, "their carcasses become the prey of the marine animals gradually lower in organisation, until at length we reach those simple organisms just described (the diatoms and foraminifers). Long before the surface animals could reach the bottom they are, therefore, assimilated, perhaps

passing through many transmigrations, and ending with the lowest."

These lowly animals, then, the diatoms and others, whose very skeletons require a microscope, and other animals a little higher, must have caused the remains of many transitory and even existing types to utterly disappear. Suppose the Atlantic bottom were upheaved to-morrow, what remains could posterity find in its layers of the whale, the eel, the tortoise, the seal, the flying-fish, nay, even of the "President," or any of the thousand other ill-fated vessels, the contents of which, if preserved in the "caves of ocean," would, with the ordinary sea-weeds and upper marine inhabitants, present to the eyes of our imagined posterity the whole cycle of being, from cell to man, in one grand geological deposit?

But we find nature allows no such possibility. Live, die, or, in other words, assume one form or take another. There is only so much matter. None can long lie idle. Fresh races must be developed. Higher out of lower, lower out of deceased higher. All transition races cannot be preserved.

"Imperious Cæsar, dead and turned to clay,
Might stop a hole to keep the wind away."

The absence, therefore, of many transition links is not only to be expected, but absolutely necessary, to prove that part of our theory which relates to one race succeeding or displacing another.

In order to clearly place on record our successive conclusions we append hereunto a simply rendered Latin

version of the following canons of our new organ of natural science :—

1. Development is as infinite as nature.

2. Development is gradual.

3. Conditions—1st. Innate force or power of race : 2ndly, Climate : 3rdly, Surrounding conditions—rule development.

3 A. The elevation of land or depth of water has a most powerful effect on the respective inhabitants.

4. Similar conditions produce similar developments. Thus similar races may be produced in any similar parts of the globe, without any other relationship, save that resulting from similarity of conditions, subsisting between them.

5. Every animal tends upwards to man.

6. “ Man, slowly developed from earth, at first crawled on all fours over her bosom ; and to this fact (viz. to his earth-animal development) all his superstitions have regard, as though he felt that his race was earth-sprung, and that in the forest-clad earth there existed a power which ruled his development, and that unto this power all things were submissively obedient.”

Such are our canons, and from them we are firmly convinced we can never far depart.

The conclusions to be derived from them are so vast that they penetrate into and comprehend every phase of existence. The development we have hitherto been engaged in pointing out is but a small fraction of development considered as a whole. For development

extends not only to the vegetable and the animal, but also to the social, the religious, and the intellectual world.

As certain vegetable atoms progress from lichen or moss into grass and herbs and trees; as other, at one time merely vegetative, atoms proceed into the gradual formation of humble and then higher animal life; so does that animal life proceed into almost infinite varieties and degrees.

We lack words to adequately express, or to clearly bring out the notion, that infinitely varied development is always going on. But it is only by perpetually bearing this notion in mind, and by endeavouring at the same time to recollect that we only see a few links in the chain, that we shall realise the fact of the seemingly stationary but really progressing and changing aspects of nature.

It is precisely because development is always going on that the same species seem to us unchanged. The fact is that lower species are continually proceeding into higher, and thus a continual succession is perpetually kept up. Fixed and immutable species, if such could have been made out of the atoms of our earth, would speedily have succumbed to changing conditions. But just because species are mutable and can accommodate themselves to change, many survive and develop, though a few succumb and die out. Thus, then, change and for the most part progressive change is the order of nature. Among the highest orders this progressive change, even in manners and religion, may be most easily marked.

For instance, none, who have powers of mind able to judge of the matter, have any doubt about Comte's celebrated position of man theological, man metaphysical, and man philosophical or positive.

The 30,000 deities of the Romans have already diminished to one in most of the educated minds of Europe. Many of these minds have also become metaphysical. A few powerful minds scattered here and there over Europe, a few in Germany, a few in France, a few in Holland, and more in England and Scotland have passed through both the theological and metaphysical stage and entered into that of positive philosophy. Fetichism, idol-worship, polytheism, Hero or Saint worship hold only the weakest classes of minds. Berkely quaintly and truly described metaphysicians when he said they created a dust, and then complained they could not see. All "Positive" minds are now convinced that Berkely was so far right, for as there is nothing connected with man separable from the natural, there can be nothing supernatural in his constitution. Once, then, leave the natural or physical and search after a supernatural or metaphysical; you hunt but a non-existent entity, and in your imagination may roam abroad into whatsoever regions you please, but you will never have a clear idea again of anything actually true until you descend from what Isaac Taylor would call your "enthusiasm," or "supernatural platform," and return to the terra firma of fact, sense, and nature. There is no higher or even intermediate platform to

which metaphysics lead. Their great use is to develop the brain. Man cannot all at once cease to be theological and become positive. He gradually weans himself from superstition by launching out into the vague conceits of metaphysics. The brain gathers strength from its exertions, and rewards the search after truth by developing the organs of causality. Of course physical debility, or want of innate force, or insufficiently continuous exertion, may tend or combine to keep the anxious metaphysician in his cloudy half-consciousness all the days of his life. But his posterity may inherit the rudiments of causality and carry on the development; or his writings may excite many to read what will pave the way to their development also:—ah! we Causalists or Positives often, I fear, underrate metaphysics. Hundreds will read and admire such writing, who would shrink from the plain statements of positive philosophy. Thus by gradual and self-accommodating degrees is the human brain developed, and in consequence more correct views of nature, of man, and of man's requirements, are daily more generally entertained.

The greatest benefactors of their species since Francis Bacon, we hold to be Jeremy Bentham, George Combe, and John Stuart Mill; and first of these George Combe. The irrefutable treatises he put forth concerning the constitution of man and moral philosophy, have, in the short space that has elapsed since they were published, sensibly ameliorated the condition of mankind.

The views he put forth have permeated society and

altered the character, both of our legislation and our national character. When we consider that these works have been translated into most European tongues, and are class books in America, besides being sold in myriads almost "without money and without price" throughout our English towns, we may fairly hail George Combe as the first and greatest director and increaser of modern thought and modern science. Only those who are familiar with his writings can appreciate this panegyric. Those only will fail to re-echo it, who do not learn what England was before he wrote, and judge for themselves in how close accordance to the spirit of his writings all subsequent ameliorations have been conceived and effected.

In numerous other ways, too, can we mark changes in habits of thought, all tending to gradual development of brain. For instance, few observant schoolmasters or clergymen can have failed to see the change effected in a boy's face, head, and habits by efficient and long enough continued education. In rough grown-up men whose facial bones one would think had long ceased to be capable of any change, the writer of these chapters has seen great changes positively produced by change of thought. He has marked, too, greater and more general changes. For example, in districts like Staffordshire, the rudest pitman gradually becomes a primitive methodist, a ranter, a howling, roaring, Corybantic sort of Christian enthusiast.

His family generally become Wesleyans: their de-

scendants eventually become "church people." But the rude collier can only appreciate the ranting of the primitives, and the Wesleyan cannot at first approve of the greater restraint and absence of personal lay-importance involved in Anglican churchmanship. And to carry on the progressive stage still farther, the low churchman, as Wilberforce, or Sanderson Robins, has sons of very high church views; and farther still, when the human mind is thoroughly imbued with hereditary acquaintance with churchmanship or ecclesiasticism generally, the strength of the intellect is the only measure of the final event. Strong minds carry out the protestant principle to its legitimate conclusion, and become either deists, pantheists, or philosophically positive, according to their varying powers of causal and critical intellect. Weaker minds turn to Rome as their only resting place. Need we point to the many familiar examples of these facts which have occurred in the last twenty years? Need we more than name the Newman family, and compare the fairly-causal and highly-critical head of Francis William with that of the more receding development of his gifted brother, John Henry? It is sufficiently public, by the freely published and printed experience of this family, how carefully and religiously each was brought up, how they passed together into the theological stage, and how the natural strength of one has landed him in honourably-avowed and lovingly-expressed deism, while the somewhat inferior frontal development, and, perhaps, physical conditions generally,

of the other have forced him to accept the former of the famous tractarian alternatives—Rome, or what Romanists call “infidelity.”

In a much lower phase of human society, we find that the more astute, the more urbane, the more civilized human beings become, the less willing are they to devote themselves to coarse manual labour. Hence Londoners depend upon Irishmen to carry bricks and climb scaffolds, upon Welsh and Irish women to carry their milk, and perform various offices, just as the Israelites of old are recorded to have reserved various tribes to hew wood and carry water. And thus heavy hods of bricks are constantly and cheerfully carried upon perilous scaffolds, milk cans clatter incessantly through the streets, though the Londoners themselves, nay, the very children of these workers themselves, cease to continue these useful occupations. The ranks of the more lowly organised Irish or Welsh produce a perpetually sufficient supply, to be, in their turn, elevated into a somewhat higher stage of social development.

And thus might we track in every social condition a tendency to advance under almost all conceivable circumstances; and never can we fail to observe that nature helps society with an unfailing supply of the native raw material. It need, therefore, occasion no greater surprise that oysters and guinea-pigs co-exist with birds and man than that papists, mormons, or primitive methodists co-exist with gentlemen like those who contribute to the pages of the *Westminster Review*.

CONCLUDING SUMMARY.

“Summa sequar fastigia rerum.”

Admitting as facts the usually received truths of astronomy and geology, and not conceiving it to be now necessary to do more than allude to the approved scientific discoveries and statements of men like Newton, Herschel, Lyell, Buckland, Murchison, and Humboldt, we may take for granted—

That the earth is part of a vast planetary system, moving through space in obedience to persistent and well-defined general laws ;

That an immensely-protracted series of years has been occupied in the slow and gradual modification of the planet we inhabit ;

That aeriform, aqueous, glacial, tropical, and temperate conditions have, in some sort of succession, left distinct traces of each in the constituents of the earth's surface-crust ;

That there was a time when humble plants, still humbler animals, only existed ; that shell fish succeeded and lived in oceanic periods when as yet no animal life can be proved to have existed on the land ;

That the tribes of the water were slowly followed by the saurians, birds, reptiles, and quadrupedal mammalia of the land; and that, at a still later and more recent date, are traces of man discoverable.

It has been our purpose to track up, more distinctly than has been hitherto attempted, the wonderful and absorbingly interesting process by which a crust of fused, molten, and cooled-down granite, itself the result of condensation of vastly expanded aeriform constituents, has gradually assumed the condition and aspect of the world we live in.

And even, at the risk of being blamed for speaking in too familiar language of such grand topics, we have used as few hard words or heavy sentences as possible. Nay, we would rather, (as we fear we shall,) incur the charge of levity than of pedantry, and we have preferred to be "understood of the people" to speaking in the generally unintelligible græco-latin jargon of "scientific literature."

To the, perhaps, greatest objections that partially informed minds may feel towards our theory, viz., the apparently insufficient evidence as to connecting links between race and race, or species and species we would oppose two very powerful arguments in support of our theory. The first great cause which underlies the obscurity of our knowledge as to transition forms and makes the patient observer of nature wonder not that so few but that so many transition forms are still preserved, is the nature consumption, the earth and

water decomposition, the spontaneous using up over again of the same material atoms—for there are no more, no less, than are contained in the earth's bulk, and in about forty-five miles more of surrounding atmosphere. Need we more than mention the original unstratified rock becoming secondary, tertiary, or again diluvial, or again dung, or again, as in sea-water, transformed into Ooze? We need not multiply proofs. Secondly, may not the earth's crust itself be in a process of change? May not its surface atoms be continually shifting their position? and whither? towards the north pole? to be there re-absorbed into the wondrous laboratory of nature, hidden by trackless ice from our enquiring search, but dimly revealed to us by the glorious effulgence of the aurora borealis? May not man and many animals be slowly but constantly migrating? Why did those countless tribes of Gauls and Vandals and Swedes and Goths come down from the north of Europe? How shall we account for the remains of buildings in Greenland? Is not land appearing at the south pole, even in growing continents, in huge volcanoes and only just discovered ranges of territory? Are not rocks, islands, in short, being perpetually upheaved in open seas, in well-known harbours? and must not low lands elsewhere be proportionately submerged? In short, nature proves much of our theory and disproves none of it. And by our theory every phase of nature may reasonably and satisfactorily be accounted for and understood.

Let us, then, by way of concluding summary, again rapidly resume from the point at which we have asserted that the elective affinities of atoms caused disintegrated particles to coalesce into a cell, a cell into a plant, and a plant to progress or develope in the early waters into an animal.

Animal life must have commenced in the water: only water could supply the materials of existence in the ages which first followed the upheaval and disintegration of granite. In these present times, when primary, secondary, and tertiary deposits are freely mingled with still more recent layers of animal and vegetable remains, life may spring up anywhere, wheresoever, in fact, the materials necessary to existence may be found together. A storm of wind, a shower of rain, a ray of the sun, may, in almost any quarter of the earth's present surface, supply the last requisite to seemingly inert materials, and life will be the result.

Thus many seeming contradictions to the old, slow, and progressive law of development may be noticed; but none greater than the marvel of marvels, the bringing into existence in nine months that epitome of the universe, that crowning glory of the world, that comparatively instantaneous reproduction of the travail of countless ages—a fully-developed English child ! *

* See Appendix.

If this, the grandest of all nature's works, can be thus speedily produced from the original cell, developed onwards into the surpassing microcosm of a perfect human being of the highest existent order, why should we be surprised if in other developments of nature also we see at one and the same epoch other surprising changes which appear rather exceptions to than proofs of the rule which experience of nature's consecutive works demonstrates to have been a true rule ?

The solution of the contradictions is to be found in the vastly altered and mingled atoms which now compose the earth's surface ; and our whole theory would be wrong if these very contradictions which may almost everywhere be observed did not exist. In an immensely changed condition of superficial atoms, this earth must produce perpetual variations of type and character, of being and brain.

Perpetual change is the very order of nature, but yet most closely allied to, and associated with persistency of tendency, and the general laws of cause and effect. No animal, no insect, no herb, so humble that it is not perpetually being acted on and modified by the circumstances which environ it.

And so with mankind also. Revolutions in thought, fashion, dress, habits, are absolute necessities depending as to their radical proximate cause on atmospheric, physical, cibarial, political, social, and commercial conditions. Let a wet, cold summer ravage Europe, a reactionary season is the result : a season of re-action in

thought, politics, religion and happiness. The leading journals of imperial London throw open their columns to Caffre-like rain doctors or Chaldean prophecy-men. Bankruptcy and fraud are common. Crime is rife, superstition is rampant, intellect is at a stand-still. In a word, re-action has its temporary reign.

But let a favourable disposition of sun and rain and wind befall our dwelling places. The means of life are easily obtained; health and brain are sound, a wholesome feeling of progress begins to make itself felt. Humanity strives to progress, and all nature, which does not stand in the way of the ruling races, make a stride in advance.

With all this progressive and by turns re-actionary condition of mankind, there co-exists the old original process of cell-construction in the waters and now also of humble life on the land. Sea weeds are daily being developed afresh as at the beginning. Those curious animal-plants, the sponges and corallines, are still reproducing their lasting skeletons while they themselves return to the fibrous and gelatinous materials from which they sprang, but return not until they have either started gemmules of higher being on their onward course of progress or laid the substratum for more advanced orders of nature to exist upon. What, though the coralline insect die? His skeleton uprears a rock in the midst of the barren wave on which shall grow plants and trees and man. What though the humble Zoophyte seem to perish? he has done his work and his descend-

ants shall carry it on, on, perpetually on, until the round of nature be complete. The power of secreting, which a sponge possesses, in a humble degree, shall enable a being of its race to secrete atoms of lime or flint, and a shell-fish shall be the eventual result. From the shell-fish, itself the homologous skeleton of man, shall develop the modified skeleton of the fish, the advanced organism of the bird, and the more perfect constitution of the mammal. And what is man but a mammal of correspondingly advanced cerebral organisation?

Thus all plants and animals, all the works and operation of nature, cohere together, evolving from her unperishing and exhaustless womb an ever fresh succession of lowly types to advance into higher, and even to replace the almost countless losses or developments which the constitution of a globe of variable atoms perpetually necessitates.

Under this view of nature's laws there is no place for objection on account of seeming contradiction. There can be no greater amount of seeming contradiction than our theory leads us to expect. We anticipate, by the very acceptance of such a theory, an endless and protean series of change and re-production, of action and re-action, of apparent disorder but necessary order, in the highest as well as in the most ordinary evolutions of nature. One wind may bring us health ; another, disease ; one, food ; another, famine ; and straightway we flourish or pine, rejoice or suffer. Similarly, an upheaval of earth, or overflowing of water, may mingle materials

hitherto separate, and forms of being, hitherto non-existent, spring into life.

But as the bird makes a nest, as ants store up winter food, as countless animals select and prepare abodes, provisions and contrivances against calamity; so does man seek to ward off possible ill by the exercise of thoughtful precaution.

Let him once recognise *how much*, how *indescribably much* is within his own sentient control, and what may he not hope to do? He *is* rapidly bridging the oceans, annihilating distance, outspeeding all, save his servant the lightning, in the transmission of his mere commercial messages. He may, if he will but turn his intellect to the mysteries of plant and animal life, work still grander blessings to himself and his fellows.

Shall the devastating storm and the pathless waters be robbed of their peril? Shall the rude and boisterous elements be deprived of their power to harm? And shall man fear or hesitate to turn the same powers of investigation and discovery into those other hitherto secret processes of nature on which our well-being still more intimately depends?

Let men recognise life as a physical fact.

Let men regard the source of being as within their knowledge, and to a vast degree, under their own control; and let them seek to learn its laws and requirements. Let the laws of plant and animal procreation be more diligently studied. Let the laws of society, of biology, of the mind, of the human race, be more uni-

versally investigated. And it will be found that man, though still the variable compound of atoms of an ever changing earth, has in his own hands, to a degree now scarcely imagined, much less believed possible, the source of his own well-being, the happiness of the community, and the perfect knowledge of himself.

APPENDIX A.

To unreflecting readers the author's Anglo-latry may seem over-strained, and, perhaps, unreasonable. But he pleads stoutly for the truth of the fact that the English are the foremost race of the whole world. Other nations may consider themselves aggrieved, and even Englishmen may think this statement rather a tribute to national pride than as proceeding from deliberate and scientific conviction. But the writer of these chapters soberly, and in utter freedom from exaggeration, repeats his opinion, and will be happy to confirm it by the most copious proofs. In spite of the shortcomings of the Anglo-Saxons, with which few are more thoroughly acquainted, or of which he is convinced few are more thoroughly ashamed, he deliberately thinks over all the best points and most favourable characteristics of Germans, Swiss, Dutch, Belgians, French, Spaniards, Italians, Russians, and Turks; and he thinks of Shakespeare, of Bacon, of Newton, of Jenner, Watt, Howard, and the innumerable host of statesmen, savans, heroes, discoverers and philanthropists whom England has produced to grace the world; he thinks of England as compared with

any other nation in Europe, much less elsewhere, and, considering all her faults, he repeats, in the fulness of scientific and rational conviction, that he cannot by possibility denote or describe, in more excellent terms, the infant scion of the highest existent race of earth, than by simply declaring the noblest and best specimen of nascent humanity to be "a fully developed English child."

Had old John of Gaunt possessed half the knowledge we have of what his country was about to produce, his dying panegyric would have lasted till now.

"This happy breed of men, this little world,
This precious stone set in the silver sea,
Which serves it in the office of a wall,
Or, as a moat defensive to a house,
Against the envy of less happier lands;
This blessed plot, this earth, this realm, this England!"

RICHARD II.

APPENDIX B.

We append the canons of the *Novum Organum Naturæ*, the New Instrument of the knowledge of Nature :

Naturæ Organi Canones Sex.

I. Infinita, ut est natura, ita est Progressio.

II. Natura non facit saltum.

III α . Conditiones, suprema lex, dominantur.

β . Montium, ut marium, altitudo habitantia regit.

IV. Similes similia conditiones parant

V. Omne animal in hominem tendit.

VI. “Per humum evolvuntur; eòque omnis superstitio respicit, tanquam inde initia gentis, ibi regnator omnium Deus, cætera subjecta atque parentia.”

Totius Summa.

Conditionibus Progressionem regentibus, omne in hominem tendit. Quo homines tendant, impræsentiarum, non liquet.

APPENDIX C.

FOR the convenience of those who desire at once to refer to Tacitus for verification of our extracts, or translations, we here annex the passages themselves as found in Dr. William Smith's latest London Classic Edition of the "Germania."

XLV. Ergo jam dextro Suevici maris litore Æstyorum gentes alluuntur; quibus ritus habitusque Suevorum lingua Britannicæ prior. Matrem deûm venerantur. Insigne superstitionis formas aprorum gestant.

XL. Reudigni deinde et Aviones et Angli fluminibus aut sylvis muniuntur. Nec quidquam notabile in singulis, nisi quod in commune Herthum, id est, *Terram matrem* colunt.

"Herthum—Herthus is manifestly the same word as the German Erde, and the English Earth."

XLVI. The Fenni "Securi adversus homines, securi adversus deos, rem difficillimam assecuti sunt, ut illis ne voto quidem opus esset." (Denial of argument drawn from "Universal consent.") "Cætera jam fabulosa *Hellusios et Oxionas ora hominum vultusque, corpora atque artus ferarum gerere* : quod ego, ut incompertum, in medium relinquam."

XXXIX. (Vide the pilgrimages of Indian apes and confer—)

“Vetustissimos se nobilissimosque Suevorum Semnones memorant. Fides antiquitatis religione firmatur. Stato tempore in silvam, auguriis patrum et priscâ formidine sacram, omnes ejusdem sanguinis populi legationibus coeunt, cæsoque publice homine celebrant barbari ritûs horrenda primordia. Est et alia luco reverentia. Nemo nisi vinculis ligatus ingreditur, ut minor et potestatem præ se ferens. Si forte prolapsus est, attolli et insurgere haud licitum; per *humum* evolvuntur. *Eoque omnis superstitio respicit tanquam inde initia gentis, ibi regnator omnium deus, cætera subjecta atque parentia.*”

(Universality of worship of Earth as common mother.)

“Nearly all the circumstances mentioned here concerning the worship of Herthus, agree with those practised at the worship of the deity of the earth (called Ceres, Rhea, Ops, Demeter, Cybele or Isis), in Thrace and Phrygia, by the Cabiri, Corybantes, and Idæan Dactyls.”

Tacitus's belief about the Germans (our forefathers).

II. “Ipsos Germanos indigenas, (“*Αυτοχθονες*,” or, Sons of the Soil,) crediderim.”

“Celebrant carminibus antiquis (quod unum apud illos memoriæ et annalium genus est) Tuisconem deum *terrâ editum*, et filium Mannum, originem gentis conditoresque.”

Proof of *peculiarity* of German race.

IV. Ipse eorum opinionibus accedo qui Germaniæ po-

pulos nullis (aliis) aliarum nationum cōnnubiis infectos, propriam et sinceram et tantum sui similem gentem extitisse arbitrantur. Unde habitus quoque corporum quanquam in tanto hominum numero, idem: omnibus truces et cærulei oculi, rutilæ comæ, magna corpora, &c., &c.”

Their religious conceptions were naturally of a high order.

“Ceterum nec cohibere parietibus deos neque in ullam humani oris speciem assimilare, ex magnitudine cœlestium arbitrantur.”

Their policy enlightened.

“Reges ex nobilitate, duces ex virtute sumunt, nec regibus infinita aut libera potestas, et duces exemplo potius quam imperio—admiratione præsumt.”

Their domestic virtues and attachments.

“Præcipuum fortitudinis incitamentum—familiae et propinquitates.”

“Quanquam severa illic matrimonia nec ullum morum partem magis landaveris. Nam prope soli barbarorum singulis uxoribus contenti sunt, &c.”

“Litterarum secreta viri pariter ac feminae ignorant. Paucissima in tam numerosa gente adulteria.”

“Plusque ibi boni mores valent quam alibi bonæ leges.”

“Victus inter hospites comis.” “Potui humor ex hordeo aut frumento in quandam similitudinem vini corruptus.”

“Funerum nulla ambitio—sepulchrum cæspes erigit.”

“Feminis lugere honestum est: viris meminisse.”

APPENDIX D.

It would well repay the trouble of perusing the July number of the *Westminster Review*, to be able to mark what we may call the ebb and flow of Positive Science. We have had a cold, wet, dull year; the tide of science has, consequently, been ebbing, and the staunchest supporters of Positive Philosophy temporarily lose faith in their first principles. We quote a few lines from page 178 of this, the XXXV. or July number.

“With all its scientific and philosophical resources, the new Pantheistic theory solves no difficulties. Is the soul immortal? It cannot certainly affirm that it is *mortal*. Is there a creative principle? It knows only of an evolving intelligence. Is matter eternal and self-existent, or produced in time and dependent? Whence came the first homogeneous germ—the primeval egg, which potentially included all forms and varieties of life? To these and other kindred questions—as the rationale of the existence of moral and physical evil—no answer is returned—none, we believe, attempted.”

Thus Positive Science is charged with inability to

solve the following difficulties. Is the soul immortal? Is there a creative principle? What is matter? Whence the primeval egg? And evil?

Positive science does answer many of these questions, hard as they are.

First, as to the soul. The soul or life of any one individual is not necessarily immortal. It is absolutely unchristian, as it is most decidedly unphilosophical, to assert such a thing. To say the soul is eternal and necessarily immortal is to revive the old theological heresy of making God non-omnipotent. If a soul were, *per se*, immortal there would be something God could not do, viz., destroy it. The soul, therefore, must be destructible, or God could not be omnipotent. So much for the Christian theological argument, which we find clearly announced in the New Testament in those passages, which ascribe to God power of destroying both body and soul, and which describe to us Apostles praying that they may be permitted, in any way, to attain unto the resurrection of the dead.

Next, to speak more philosophically, there can be no such thing as a necessarily existing, separable, independent, or immortal soul. The word soul is only an old word for life, or person, or existence. We still call the blood, (which was "the life" of the bird,) in the back of a roast fowl "the soul."

The life or soul of man is three-fold: 1st, vegetable, whereby he grows like a plant, in some respects even after what we call death, in such matters as hair and

nail growth; secondly, animal, whereby he grows just as any other creature on the earth's surface grows; thirdly, intellectual and moral,⁴ whereby he grows into a creature of higher intellect, sensibility, and prudence than other animals. This third and higher form of life results from accumulated inheritance of brain, especially of frontal and superior brain, whereby, as by muscles of thought, he secretes noble and beautiful ideas; and these ideas, if well spoken, written, or worked out, live after him, and we, the rest, are able, after the decease of such idea-secretors or authors, to have their works "always in remembrance"—an inheritance of true good to us, of immortality to them. But, so far as the individual soul is concerned, all these triple lives die with the extinction, or complete disorganisation, of any one of them. Let the cellular process be interfered with, the respiration stopped, the circulation destroyed, the brain be disorganised, the man, brain, animal and vegetable, all die for ever. The blood is the life or soul, the breath is the life, and the brain is the soul. Disorganise any of these vital parts, the soul is destroyed. There is nothing in man, as man, separable from man. There is no such thing as an "immortal soul."

Secondly, is there a creative principle? We will answer this as philosophers only, not theologically also. We believe, from a certain observed order of progression, that there is an ordaining and evolving intelligence, a source of development, a mighty disposer or arranger of certain general laws (such as gravitation) in obedience

to which spheres are formed, currents of heat, air, and water act on spheres, atoms cohere, separate, act, and re-act on one another, and all we see is gradually developed. But Positive Science knows no "creative principle," nor is even any modern theology wild enough to assert such a thing, in the sense of a creative principle creating all things at once, just as we see them, either out of nothing, or out of chaos. Positive Science has, at least, grappled with delusions on this head, and "precept upon precept, line upon line," and "by little and little," even in the way nature works, will gradually drive out all ignorance from before us.

Thirdly, is matter eternal? It is eternal, and, as all chemists know, practically indestructible. Its form may change, but, like "the everlasting hills," it "endureth for ever."

Fourthly, whence came the primeval egg? From disintegrated granite, acted upon by currents of moisture, light, and heat. The process is going on all around us, uprearing and maintaining an ever fresh supply of humble forms to be developed into higher.

Fifthly, as to the rationale of the existence of moral and physical evil: if by this is meant, why does evil exist? or if the objection means, how does evil exist? The answer is equally easy.

There is no such thing as evil, in the sense of eternally wrong, bad, or hideous.

What we call evil is merely a temporary distortion, displacement, or misapplication of force or will. The

strength or the will to do good may be distorted into the doing a murder, but the strength or will, so temporarily misapplied, are not eternally evil. They are just what they were—strength and will. Like manure polluting our atmosphere or our rivers, evil is only “dirt in the wrong place.” Evil is relative not absolute. Almost everything, perhaps everything, we call evil is absolutely under our own control, *and we may alter and amend it if we will.*

This is the great end of our Positive Philosophy, let it be called by whatever name critics or reviewers are pleased to call it. Let one man call positivism material, another peo-pantheistic, theistic, or atheistic, our Positive Philosophy contradicts nothing that is really true, holy, or good, but convinces us that progression is the law of humanity, and that man may correct whatever social evil retards or vitiates his onward progress.

Is dirt in the wrong place? Remove it : put it in its right place, and it becomes a substantial blessing.

As against pestilence, so against crime and every moral evil, let each man arm himself at all points for the contest, and fix a moral “paddle to the end of his spear.”

Let him *form*, (he need not then re-form) help, expand, and develope whatever is now rude, weak, narrow, or puny in himself and those under his influence. Let us work all together and with a will ; and what “dirt” would long remain “in the wrong place?”

Plague and small pox have been once robbed of their

terrors. Shall they by a "faithful," *i. e.*, credulous, superstitious, and re-actionary generation be allowed to resume their "evil" course among us?

We assume to legislate against "nuisances" or evils to health; but, in an age of temporary re-action, we stagnate for awhile, and "orthodox" cleverness declares decomposition healthful and sewers salubrious. Soon, we trust, the waters of Positive Science will flow again, and the present ebb leave but few traces of its algæ on the recording strata of our sociological tablets.

Enough if, for the present, we boldly answer the feeble-hearted despondency of the only intellectual review now printed in the world, and bid its Writers be of good cheer, for Positive Science will vindicate her truths, and their long struggle for truth's sake shall be gratefully acknowledged by succeeding and wiser generations.

FINIS.

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